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THE WORLD'S LEADING R/C CAR MAGAZINE

OFF-ROAD WARRIORS

**OFNA Ultra
Worlds GTII**

**FACTORY TEAM
RC10GT**

**KYOSHO
Lazer 2000**

PLUS

**SCHUMACHER .21 TOURER
JR RACING XR-3 FM RADIO**

HOW TO

Rebuild your transmission

**TRUCK
OF THE
YEAR**

Who won? Find
out—page 80

HEAD to HEAD

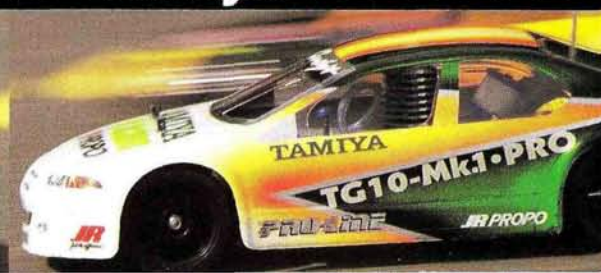
Kyosho World Cup vs Tamiya TG10 Pro

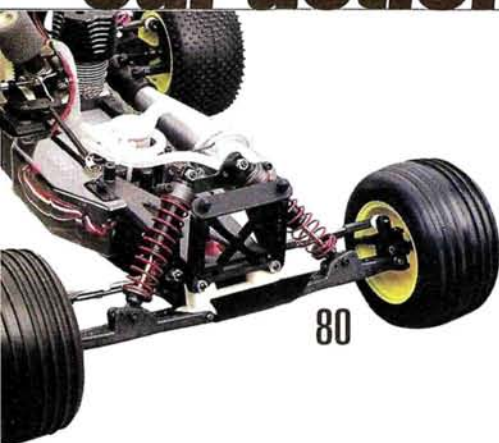


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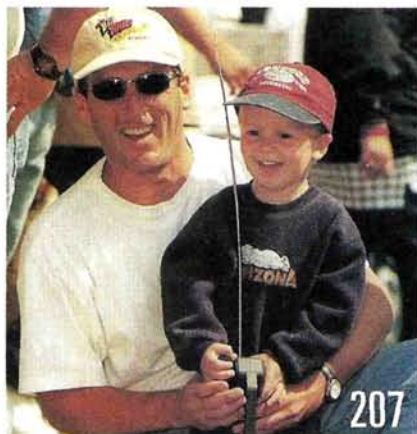
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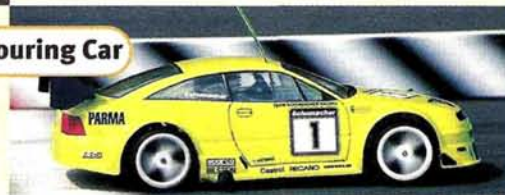
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ON THE COVER (from top): OFNA Racing Ultra Worlds II; Kyosho GP Spider MK-II World Cup Edition; Tamiya TG10-Mk.1 Pro (all photos by Walter Sidas).

Best in the World

Has a nice ring to it, doesn't it? Not regional champ, not state champ—world champ. That was the title up for grabs as the best off-road R/C drivers on the planet duked it out in Finland at the **IFMAR Off-**



Road World Championships,

and this month, well-traveled senior West Coast editor George Gonzalez brings you all the inside stories: stunning upsets, professional personalities and

much more in his in-depth coverage of the biannual event.

This month also marks the emergence of a different type of champion, as we pick the 1999 *Radio Control Car Action*

Truck of the Year. Stop reading now if you want to be surprised: it's the Team Losi NXT. I

think we made the right pick; the NXT is a well-thought-out truck that improves on the original GTX

while maintaining that easy-to-drive feel that has become a Team Losi hallmark. Good stuff.

On-road gas guys have something to look forward to as well, as



assistant editor Greg Vogel and I go head to head with Japan's hottest full-option tourers, the Tamiya TG10 Mk.1 and Kyosho GP Spider MK II World Cup

Edition. **The Rising-Sun-Racer**

Rumble settles all king-of-the-parking-lot disputes with comprehensive test data you won't find anywhere else!

And, finally, there's something for everybody in this month's "Thrash

Test" section: from the **OFNA Ultra Worlds GT II** to Kyosho's entry-level all-

wheel-driver and a .21-powered tourer from Schumacher, we have all the bases covered.



Until next month,

Peter Vieira

Peter Vieira

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A Hero

DR. LOUIS DEFRADESCO 1923 - 1999

Our father was a hero. He loved his family and served his country, and his beautiful spirit touched the lives of so many people, including those in the R/C industry.

When our father greeted you, you were always assured of a warm smile and a sincere handshake; his kind eyes seemed to peek into your soul. People always remembered him and he remembered them; he always had time to listen.

From the early '50s, when he could be relied on to take the train from New York to attend the annual Hobby Industry of America show in Chicago, he supported the industry and inspired those who shared his vision. His foresight was manifested in many ways: he recognized the value of R/C as a very creative hobby and supported the inauguration of big events that brought the hobby to the general public. The Las Vegas Tournament of Champions, which is now the event on the R/C airplane calendar, was created by Louis and Bill Bennett, president of Circus Circus Hotel and Casino, Las Vegas. He was well-known and well-liked throughout the hobby and a close friend of many of the hobby's "originals"—the founders.

He supported all of our magazines and, never afraid to take risks when presented with a new idea, he always encouraged innovative ventures. From its inception in 1985, Doc was a strong supporter of *Car Action*, and he recognized the need for it in the exploding R/C car market. He shared our determination to publish high-quality R/C magazines and books.

Those who have worked with us at Air Age for many years well remember his kindly presence and the interest he took in them and their families. They also remember his cooking! Lunch was often quite an event!

But where did this all start? Like so many immigrants before him, yearning for freedom, as a boy, my father stepped onto Ellis Island with just a small suitcase and a dream.

Yet throughout his life, his heritage was never forgotten. Everyone who knew "Doc" knew he loved life—especially all things Italian: its art, beauty, culture and rich history. This was expressed through his painting, sculpture, travel and his often memorable culinary endeavors.

After being in America for only a few short years, he proudly rose to the call of his country, spending almost three years in combat, both in Europe, where he participated in the D-Day invasion, and in the Pacific, during the battle of Okinawa. He earned decorations for his valor and his wounds, including the Purple Heart.

Despite nearly losing his life and enduring unimaginable pain, the darkness of war never daunted his spirit, and he made a career of bringing beautiful smiles to people's faces. For kids, a trip to the orthodontist with "Dr. D" resonated with warmth and laughter.

And our father's gift of bringing smiles was not limited to his professional practice. As a husband and father, he stood by and guided his family with love, compassion and understanding. There was always an abundance of affection as well as forgiveness—a true hero by example.

Even though presented with some of life's deepest adversity and loss, we often heard him say, "In life, there's hope."

His heroism spanned three generations, and his loving

example found its way into the hearts of his grandchildren, whom he so cherished. He beamed at even the slightest mention of them, and he loved their shenanigans!

Many people have told us that they always heard our father described as a "true gentleman"—and a *gentle* man.

And though words could never adequately describe all that Dr. Louis DeFrancesco embodied to so many people in so many walks of life, we are convinced that the legacy he wanted us to continue is one that reflects timeless values—hope, love, passion and heroism.

His warm presence is so missed.

—Louis and Yvonne DeFrancesco, August 1999



Doc with his grandson Emil at the workbench.

Easy Rider

Is there a company that makes an R/C motorcycle that can be customized for great speeds? My friends and I want to start an R/C motorcycle drag-racing club. Which would you say is better: the DSI Ninja Super Gyro or the Bachmann Cyclone? They are the only motorcycles I have ever seen advertised. Your response would be greatly appreciated. Thanks.
[email]
ROBERT G.

Kyosho used to make an awesome 1/8-scale bike that featured a rider that actually poked his knee out to hustle around turns. I'm not kidding! Unfortunately, the little bike required a special ESC/servo unit and non-standard mini stick packs to run. Royal used to offer 380- and 540-powered bikes. The 380 bike is now offered under the Bachman label, and it's a speedy machine that accepts "regular" 7.2V stick packs. However, it uses dedicated electronics, and it isn't really "hop-appable." If you can find one, the Royal 540 bike is the one to get; you can put in your own high-performance R/C car electronics (including low-wind mod motors) and build a real road rocket. The DSI bike is more of a toy. It runs OK, but if you've seen or experienced "real" R/C gear in action, the DSI bike will probably leave you flat.
—Pete

A Tribute to Matt Francis

I recently attended the seventh annual Motor Man Race at Hawks R/C Racing in Antioch, CA. While there, I saw some great racing and very good driving. However, nobody stood out the way Matt Francis did. This guy can really move a buggy around a track. He was also very friendly and helpful to all the fans and racers. He must have answered a thousand questions, from tire setup to gearing and so on. Never once did he act like he was being bothered, unlike a few other racers who seemed to have bad attitudes in similar situations, as if helping was a waste of their time. I guess those guys have forgotten that they once were in our shoes. Matt wasn't

like that; he went out of his way to help you. It's good to see someone with a full ride still giving back and helping out racers. Matt has a great attitude about the hobby; he didn't make us feel like there were separate classifications for pro's and rookies. So I guess what I'm saying to Matt Francis and the other drivers like him is, "Thanks; we really do appreciate it."
DUSTY NIDAY
Sonora, CA

It isn't used; it's "Pre-Owned"

I'm new to R/C car racing, and I would like my first kit to be used because I'm low on funds. How should I go about looking for one? I would like to have an RC10T3 or a Losi XX-T "CR." Thanks. Your mag is the best! [email]
—Pete

Buying used can be a good way to save money, and you can find some great deals out there. The best source for good used gear is your local track. If the shop there doesn't have a designated area for used cars, or at least a bulletin board with used-car info, just stroll around the pits on race-day, and you'll probably find someone looking to move a car or truck. You can also look in the *R/C Car Action* "Classifieds" in the back of each issue, and Internet auction sites such as www.ebay.com are also a good resource. A few buying tips: don't pay more than 50 percent of the kit's "new" price; inspect the vehicle thoroughly before you buy; insist that any included electronics be demonstrated; and make sure that you get the kit manual (unless it's a total steal, and you don't mind buying a manual). Speaking of "steals," do not buy any car, truck, charger, or anything else that you suspect is stolen. (Hint: if the seller doesn't even know what kind of vehicle he's selling and he only wants \$20 for a \$300 rig, it's stolen.) Buying stolen goods is a crime, not to mention just plain bad. How would you feel if your R/C pride and joy was ripped off just so some jerk could put \$20 in his pocket?
—Pete

Hip Hop-Up Hooray

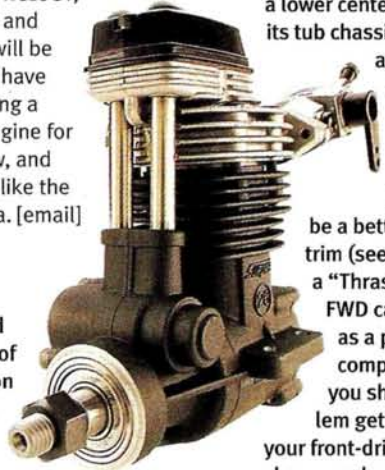
I have a Tamiya TA02 with FRP chassis, FRP front and rear damper stays, full ball bearings, Manta Ray ball diff and torque splitter, aluminum front hub carrier, aluminum motor mount, Novak Tempest Max ESC and Reedy Tri-Sonic Modified motor. I was just wondering, what else should I do to make it better and faster?
[email]
THOMAS CUMMINS

Thomas, you've almost pegged the needle on the hop-ups, but you missed some biggies. Tamiya's Low Friction shocks are awesome (part no. 53280). A set of turn-buckle upper links (OP-191) will improve the car's adjustability, and for pure trick factor, you can replace the FRP chassis plates with woven graphite pieces (53195). You can eliminate some driveline chatter by replacing the front dogbones with universal axles (53172). Don't overlook tires; a sticky set of sneakers such as Tamiya's Type A or B belted slicks (or any race rubber from Pro-Line, Team Losi, HPI, etc.) will dramatically improve performance compared with the stock tires.
—Pete

Four-Stroke Hopeful

I have been seeing a lot of that new O.S. FS26S-C 4-stroke engine. I saw a conversion kit listed in *R/C Car Action* for the Kyosho SuperTen GP and was wondering if you knew whether a kit is needed to put one in an Associated RC10GT, and if so, if and when one will be available. I have been wanting a 4-stroke engine for a while now, and this seems like the perfect idea. [email]
ERIC

Yes, you would need some type of a conversion kit to put a 4-stroke in the GT, but I don't know of anyone who offers such a kit or who is working on one. It would



WRITE TO US! We welcome your photos, drawings, comments and suggestions. Letters should be addressed to "Letters," Air Age Inc., *Radio Control Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606. Letters may be edited for clarity and brevity, and each must include a full name and address or telephone number so that the identity of the sender can be verified. We regret that, owing to the tremendous numbers of letters we receive, we can't respond to every one.

EMAIL ADDRESSES:

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Greg Vogel: gregv@airage.com

be cool, though; I can see Robinson Racing Products getting on this, or maybe Associated will read your letter and get excited. Why not send a "Wouldn't it be cool if ..." letter to both companies? For that matter, I encourage all of our readers to let the manufacturers know what sorts of products you want to see. Send a letter or drop them an email; they'll be glad to hear from you.
—Pete

Front Lines

I am interested in front-wheel drive (FWD) cars. I was reading the "Thrash Test" on the Tamiya FFO2 Peugeot 306 Maxi, and I wondered if Tamiya's New Beetle uses the same chassis. Also, I read something about FWD cars running with 4WD cars. How would I convince my track to allow that?
CHRIS BROWN
Wintersville, OH

The New Beetle is built on the older TA02F chassis; it includes oil-damped shocks that are superior to the friction units found on the FFO2 chassis. The TA02F also has a lower center of gravity, thanks to its tub chassis, but the FFO2 appears to have better weight distribution by virtue of its forward-mounted battery. Both are fun, but the TA02F should be a better performer in stock trim (see the June '99 issue for a "Thrash Test"). Since your FWD car will be perceived as a performance liability compared to 4WD cars, you should have no problem getting the OK to run your front-driver in the 4WD sedan class ... unless, of course, you trounce the competition, at which point someone will protest.
—Pete

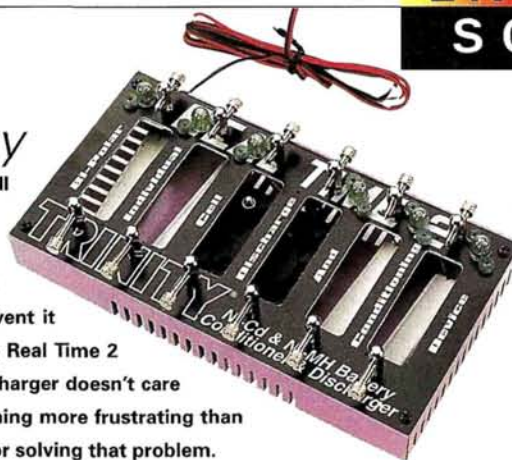


Voltage Vampire

Trinity Real Time 2 Discharge Tray

The latest version of the Real Time discharge tray is Trinity's best yet. You still get a built-in cooling fan (love that), but it's the new features that really make this thing cool (I just punned, didn't I?). The fan is now wired to a pair of alligator clips that can be attached to the pack to maintain a constant drain on it (like a dead short) or clipped to a separate power supply to prevent it from deep discharging when dumping Ni-MH cells (they don't like that). The Real Time 2 is also super easy to use, thanks to its "bipolar" design. Simply put, the discharger doesn't care which way you load the cells, since each cell has its own circuit. There's nothing more frustrating than having to reconfigure your packs to fit your tray! A big thumbs-up to Trinity for solving that problem.

Trinity Products Inc., 36 Meridian Rd., Edison, NJ 08820; (732) 635-1600; fax (732) 635-1640; www.teamtrinity.com.



Rev up your Radio

You'll be glad to know that Panasonic now offers a 700mAh AA Ni-Cd just for transmitters; it says "R/C Transmitter Super Cell" right on it! The extra capacity means your radio won't dump on the stand, and you'll get extended wheel time when you're just out playin'. Trinity has the new Panasonic cells; give 'em a call for info.

Trinity Products Inc., 36 Meridian Rd., Edison, NJ 08820; (732) 635-1600; fax (732) 635-1640; www.teamtrinity.com.

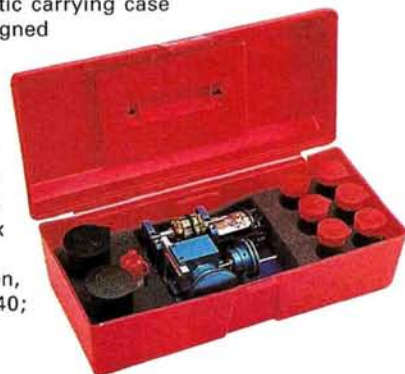


TRINITY "BOX SET" TRU LATHE 2 PRO

This isn't just a lathe; it's an entire motor-rebuild work station in a box! The setup includes Trinity's latest Tru Lathe (which is now blue-anodized and features ball bearing armature guides), six armature tubes, two motor cases and a bottle of comm drops. The snazzy red plastic carrying case is custom designed to hold the lathe and support equipment.

Sure, all this stuff will help you build faster motors, but the real benefit is the psyche-out factor when you break open the box in the pits!

Trinity Products Inc., 36 Meridian Rd., Edison, NJ 08820; (732) 635-1600; fax (732) 635-1640; www.teamtrinity.com.

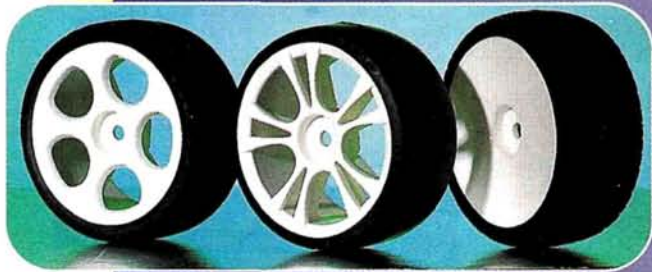


GO GUMBY!

New Pro-Line touring-car wheels

Pro-Line has updated its wheel line with the Axis, Gumby and Velocity designs shown here. The Velocity dish rims are available only in white, while the Axis and Gumby models are also available in silver and chrome. All three designs are available in 24 and 26mm widths.

Pro-Line/Jaco, P.O. Box 456, Beaumont, CA 92223; (909) 849-9781; fax (909) 849-2968.



Juggernaut Suspended!

As you probably already know, Tamiya is shipping upgrade kits to Juggernaut owners who experienced bevel-gear failures. Naturally, we expected the new parts to be included with production Jugs, but Tamiya has instead opted to suspend production of the highly anticipated and, gear problems notwithstanding, well-received truck. No official word from Tamiya on the Jug's future, but rumors abound: some say an all-new design is in the works; others expect a revised Juggernaut to appear in the near future. *Radio Control Car Action* will keep you informed! In the meantime, my advice is this: if you have a Juggernaut, hang on to it! I smell a collectors' item!

DURATRAX GOES 1/8 SCALE

After launching the Maximum ST nitro truck, DuraTrax's Maximum BX buggy (seen in last month's "Scoop") wasn't much of a stretch. But I never expected an 1/8-scale buggy! The new DuraTrax Axis looks like a hot machine. According to DuraTrax, the Axis will include:

- 3mm 6061 T6 aluminum chassis, shock towers, and upper deck.
- Torq .21 engine.
- Full ball bearings (18 total).
- Sealed radio box.
- Front and rear disk brakes.
- Steel ring and pinion gears in the front and rear gearboxes.
- Planetary gear diffs.
- Universal front axles.
- Manifold and race-legal tuned pipe with a unique, clamping pipe holder.

... and a lot more than I can list here. But the coolest thing about the Axis is how little time it takes to get it up and running; like the "Maximum" line, the Axis arrives RTR, complete with a painted and trimmed body, installed radio and batteries! No doubt, 1/8-scale off-road will never be easier.

DuraTrax; distributed by Great Planes Model Distributors, 2904 Research Rd., P.O. Box 9021, Champaign, IL 61826-9021; (800) 682-8948; fax (217) 398-0008.



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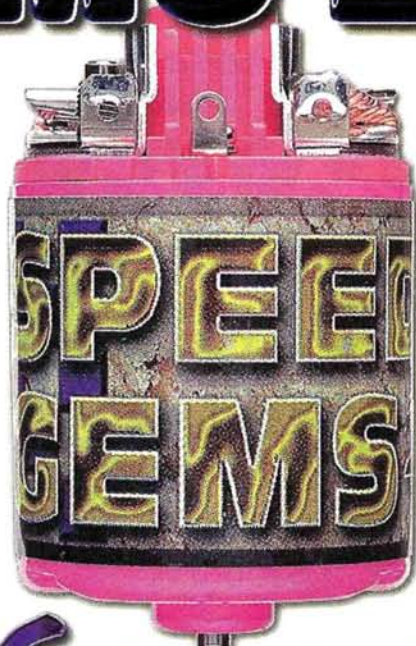
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13 Turn Double
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Pivots and pinions from HG

There's no loitering around the CNC machine when Hammad Ghuman's in the shop; here's what's new. For you Team Losi NXT owners, rear pivot supports add beef and look killer. They also add convenience: the rear support is drilled for 2 degrees and 4 degrees of toe-in. Just flip the support over to choose the setting you want.

If the Associated RC10GT is your gas rig of choice, the new HG idler gear is perfect for bomb-proofing your tranny. It's precision-machined from 7075 alloy then hard-coated for super durability.

Finally, you electric racers will want to check out the HG pinion line. The top-hobbed, precision-bored gears feature double 5-40 setscrews and are inscribed with the tooth number on the side of the shank so you can easily read it with the pinion installed. The prototypes shown here are natural aluminum, but the production pieces will have a hard-anodized finish with a Teflon coating. HG will offer the 48-pitch gears with 16 to 28 teeth.

Hammad Ghuman, 6 Tower Heights, Albany, NY 12211; (518) 782-9255; fax (518) 782-9256; www.1hg.com.

KEYENCE rewrites the rules

Pictured here are Keyence's new A-07R and A-07Rz reversing speed controllers. These amazing works of technical wizardry weigh a mere 26 grams and measure only 31x26.5x18mm—that's scarcely larger than a pair of board-game dice—and pack 24 micro FETs into three-stage board circuitry. Keyence controllers have a reputation for cool running, even with hot modified motors. If that durability and efficiency are carried over to the reversing units (and I don't see why it shouldn't be!), they should be a hit.

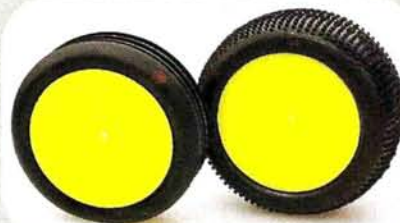
Both controllers feature push-button programming and adjustable braking, and the "z" model also features adjustable torque limiting.

GHI, 2374 North Orange Mall, Orange, CA 92865; (714) 921-0322; fax (714) 921-0380.



Ridin' Wide Losi Wide-Track Logo Rims

So, you saw Kinwald's custom-made wide rims in the last issue, and you're ready to hack together a set of your own? Wait! You can be like Brian simply by purchasing Team Losi's new wide front rims. They're 25mm from flange to flange, and they have a tasteful Losi logo molded in. According to Team



Losi, the new wheels are precisely molded to spin true and will not flex under load. Matching, standard-width rears are offered to fit the Triple-X and Double-X 4. You can get 'em in yellow—part nos. (front/rear) A-7004/A-7104, and white—A7005/A-7105.

Team Losi, 13848 Magnolia Ave., Chino, CA 91710; (909) 465-9728; fax (909) 590-1496; www.teamlosi.com.

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TK3504 The Bomb
Insert Glue, \$7.50

TK3701 Bead Loc Thick
Slow Drying, \$7.50

www.teamtrinity.com

TEAM Kinwald TRINITY

New Mid-Motor Schumacher SST

The SST has been steadily improved since it first appeared, but the latest version of Schumacher's successful tourer is a big departure from the usual SST layout. As you've no doubt already noticed, the new car uses a mid-motor, rear-battery layout, which Schumacher claims improves its responsiveness. The shocks are also more upright, as positioned by new shock towers. No word yet on specifications, availability, or price, but the new car (tentatively dubbed "Axis"), should be hitting shelves by the time this issue hits your mailbox.

Schumacher USA, 6302 Benjamin Rd., Ste. 404, Tampa, FL 33634; (813) 889-9593; www.racing-cars.com.



ANDY'S DESERT RAT

This flashy flatbed is custom-fit for the Traxxas Rustler, but you can fit it to other trucks as well (it's shown here on a Stampede). Decals are included for the headlights, taillights, grill and other details, and you can even get the body factory-painted or custom-painted by Andy Jacobsen himself! Also available clear, of course.

Distributed by Great Planes, 2904 Research Rd., Champaign, IL 61826; (217) 398-6300; fax (217) 398-0008.



PROTOFORM

Stratus Conscious

Now you can get Protoform quality in the popular Stratus shape. In addition to a fully stocked decal sheet and window masks, the 1427 Stratus features the usual attention to detail and a low-slung, "wider is better" design. An add-on wing with hardware is included, and the 190mm body is ideal for all racing-width tourers. Just ask Paul Wynn; on his first run with the new Stratus body, he took his Schumacher SST to the first-place podium spot in the Florida State Series Championship.

Protoform Inc., P.O. Box 456, Beaumont, CA 92223; (909) 849-9781; fax (909) 849-2968. ■

Traxxas

Loaded and Ready to Rock

The number-one feature of most ready-to-run cars and trucks is simply that they arrive ready to run; otherwise, "RTR" vehicles often tend to be stripped-down versions that are low on features. No more! Traxxas smashes that concept with the new ProTrax line, which features the usual Traxxas quality and durability matched with beautiful five-color bodies, forward/reverse electronic speed controls, adjustable slipper clutches and ball-bearing-equipped transmissions. I like all those technical highlights, but the pre-painted bodies are the deal-makers for me! The first trucks to get the ProTrax treatment are the Rustler and the Stampede. Look for 'em on dealer shelves soon; they might even be there right now.

Distributed exclusively by Horizon Hobby Distributors, 4105 Fieldstone Rd., Champaign, IL 61821; (217) 355-9511; fax (217) 352-0355; www.horizonhobby.com.

Wing It Your Way

I love any product that gets me onto the track faster, so you know I'm lovin' these molded wings from Protoform. They're available in black, white and gray, which is more like anthracite—very cool-looking. The plastic is stiff but not brittle, so it can take a good hit and bounce back for more. And since the color is molded in, there's no chance of its chipping or peeling (you can even dye the white one!). Best of all, the 180mm wings are pretrimmed and predrilled, they include anodized hardware and are 100 percent ROAR-, NORRCA- and IFMAR-legal.

Protoform, P.O. Box 456, Beaumont, CA 92223; (909) 849-9781; fax (909) 849-2968.



Ford Focus

Pound pavement or tear it up off-road with Protoform's 1426 Ford Focus rally shell. The 190mm body looks great in Martini factory trim, and the look is easy to get with Protoform's Martini Factory Rally decal set (1426D).



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Send a sharp, uncluttered, well-exposed color photo of your car or truck (no Polaroids, please!), along with a brief description, to Readers' Rides, *R/C Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606 USA. If we choose to feature your creation, you'll receive a free Radio Control Car Action decal sheet. You'll also be eligible to win a \$500 gift certificate from DuraTrax in the ninth annual "Readers' Rides of the Year Contest" in the fall of 1999. In case we need to contact you, write your address and phone number on your letter and on the back of every photo you send. Good luck!

Aussie Champ

Phil Northeast of Glenorchy, Tasmania, Australia, says this ride is a Tenth Technology Super Touring chassis with a JR 4721 servo to manage the steering and a Futaba Magnum Junior transmitter and receiver. A Tekin Formula 10 handles the go-power provided by a Reedy Firehawk stock motor, and it's all topped off with a Parma Ford Falcon body that Phil painted in the same color scheme used by Glen Seton, an Australian full-scale racing champ. Phil's son Luke races the car and is currently the stock touring-car champion at the Southern Tasmanian Model Car Club.



What Ticket?

Chris Bognar of Jeffersonville, IN, built this Clodzilla IV and the Bolink Legends. The "Wild Child" Clod is equipped with dual Speed Gems 2 modified 10-turn motors, a Tekin Speedstar speed control, full ball bearings, a mini cooling fan and two high-torque, full-metal-gear, clear-case servos from Cirrus. It's powered by a Sanyo 7-cell 2000mA battery and controlled by an Airtronics Caliber 3PS radio. Chris says he and his wife painted the Clodzilla IV's body. The sheriff's car paint scheme was inspired by Chris's employment with the Clark County Sheriff's Dept. It's powered by a Trinity D3.5 motor and also features a working Vector bar, Novak Super Rooster reversible speed control and a Hitec Lynx radio. Wonder if the Clod can outrun the long arm of the law?

Cruisin' Time

This Associated RC10, topped off with a Bolink '32 Ford Coupe, was built by Brandon Klevis of Frackville, PA. Equipment includes a Monster FET ESC, Hitec servo, Trinity EX Spec battery pack, Green Machine motor, aluminum chassis and Bolink racing tires. Brandon controls the car's movements via an Airtronics XL2P radio. He admits he made it a "Goodwreck" because initially, he was "not a very good driver." However, Brandon says his driving is improving. We're sure your racing buddies will appreciate that!



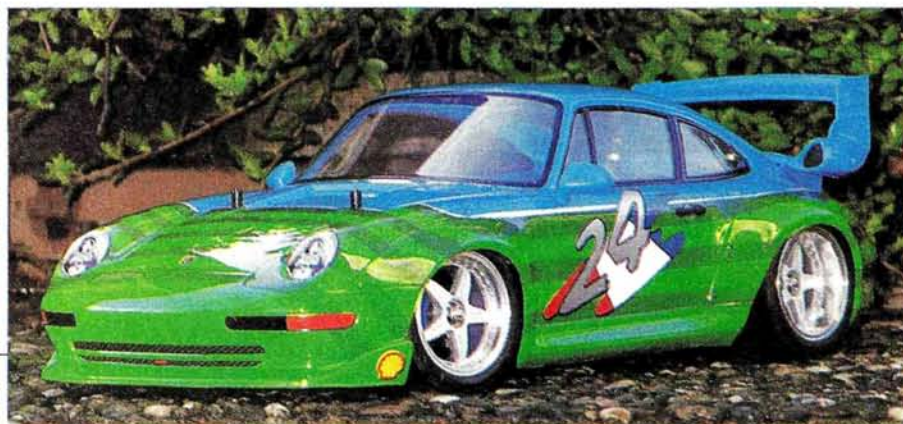
Black Splash

Jim Tomniczak of Blaine, MN, says this 1/4-scale dragster is a replica of Don Prudhomme's 1996 "Black Splash." It features a grade-8 titanium chassis built in Al Swindell configuration with breakaway points, carbon-fiber body and Motorsports Designs graphics and stickers. It also has aluminum wings and kick plates, and a quick-change Seca rear end—all powered by a Pace-Setter engine. Looks fast, Jim!

sponsored by **DURATRAX**

Porsche Power

Martin Baker, an American living in Germany, built this Tamiya TAO2 SW. He painted the Porsche 911 GT-2 body to match the 1995 Porsche SuperCup winner and added Kawada wheels for "extra realism." Nice touch.



Super Fly

This Tamiya TAO3R Belt Drive 4WD was masterminded by Christiaan Maurer of Arlington, VA. It's loaded with Boca bearings, a Dyna-run Super Touring Motor, hollow carbon gear shafts, DuraTrax Blast ESC, HPI titanium shock balls, a Tower Hobbies battery pack, and Tamiya belted racing slicks. An Airtronics M8 radio and receiver control the car's direction, and its Lexan body is a scale replica of the Nissan R390GT1 that ran in the 24-hour Tour du Mans in France.

Low Profile

John Houghton of New Rochelle, NY, sent us this shot of his nitro-powered R/C cars. The Kyosho SuperTen has "all the aluminum you can put on," from the upper and lower arms to the center gear two-speed housing and full ball diffs. It's powered by an O.S. 15 RX. The Serpent M2 features a Mega SX15, 7-port turbo engine beneath the hood. Both vehicles have full ball bearings, graphite upper decks, Ellegi foam tires, Cirrus servos and a Futaba 3PJ radio.



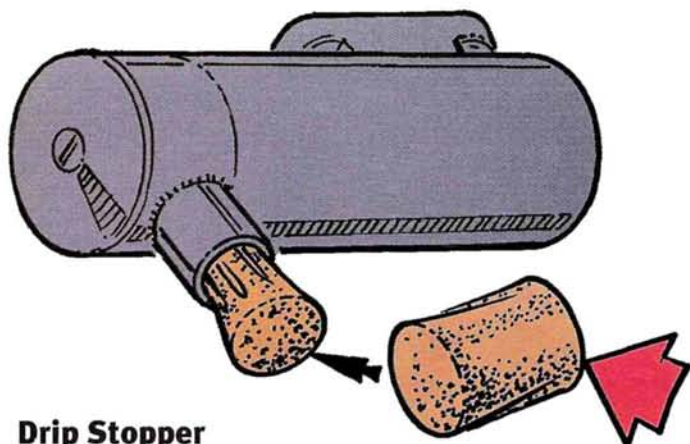
Drivin' in a Winter Wonderland

Ben Battsfore of Lansing, MI, built this 9¾-inch-tall, 2-foot-long snowmobile trail groomer, affectionately named "Big Don" after Ben's late father. Ben modeled the R/C snow machine after a full-scale trail groomer his dad owned and operated. It features four tracks, each 21 inches around, with 48 guide wheels inside. The groomer's drive train runs on 70 ball bearings, two limited slip differential transmissions, 84 cleats and a 21:1 gear reduction to the drive axle. A Tekin TDC Gold FET II speed control is mounted within the custom-fabricated, hand-painted frame and body, along with two high-torque servos. Does anyone have an R/C snowmobile around to enjoy Big Don's efforts?



BY JIM NEWMAN

Radio Control Car Action will give a 6-month subscription (or an extension of your existing subscription) for each of your ideas used in "Pit Tips." Send a rough sketch to Jim Newman, c/o Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. We're unable to publish many good tips because we don't have the sender's name and address. Please note: because of the number of ideas we receive, we can neither acknowledge every one, nor can we return unused material.



Drip Stopper

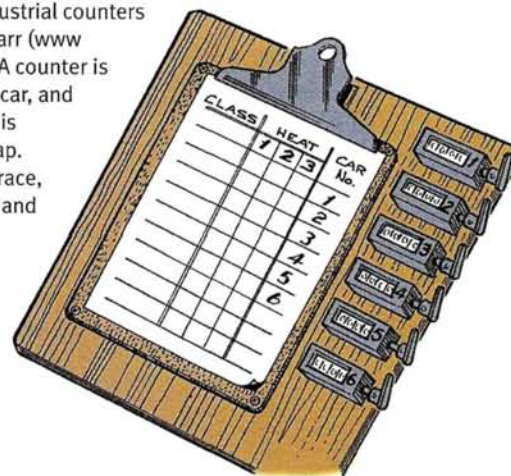
Next time you need to work on your gas car, plug the exhaust stinger with a disposable ear plug. This will prevent exhaust oil and residue from dripping onto your clothes and bench top.

JASON LINDSAY
Cheyenne, WY

Laptop Lap Counter

This lap-counting board is made from a 12x14-inch pine board, a clip-board and six industrial counters from McMaster Carr (www.mcmaster.com). A counter is assigned to each car, and the counting arm is flipped for each lap. At the end of the race, just tally the laps and get ready for the next heat.

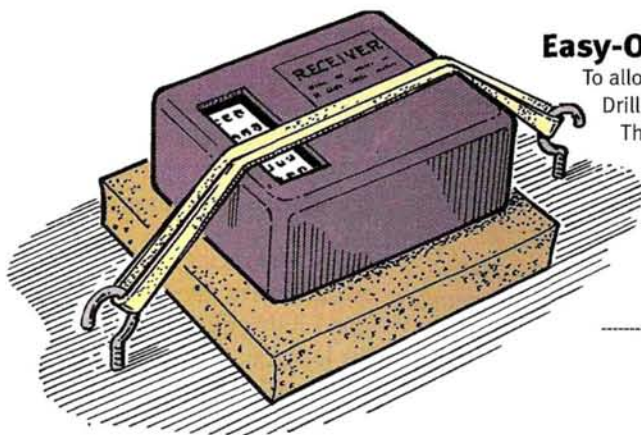
DANNY MOREAU
Monticello, ME



Easy-Out Receiver

To allow easy receiver swaps between vehicles, make this simple hold-down. Drill two small pilot holes in the chassis, spaced slightly wider than the receiver. Thread hook eyes into the holes, then use a thick rubber band to hold the receiver (you may have to trim the hook eyes' shafts so the points don't poke through the bottom of the chassis). A foam pad helps reduce vibration and further secures the receiver.

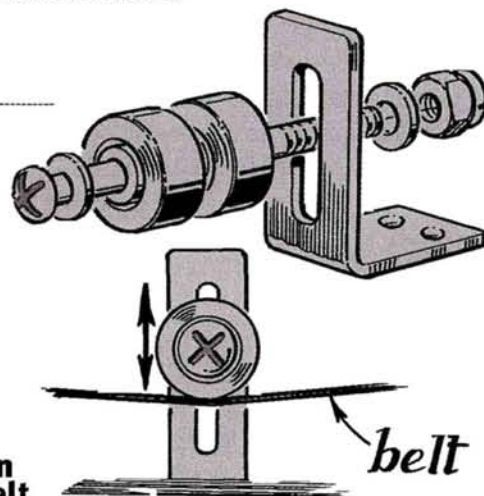
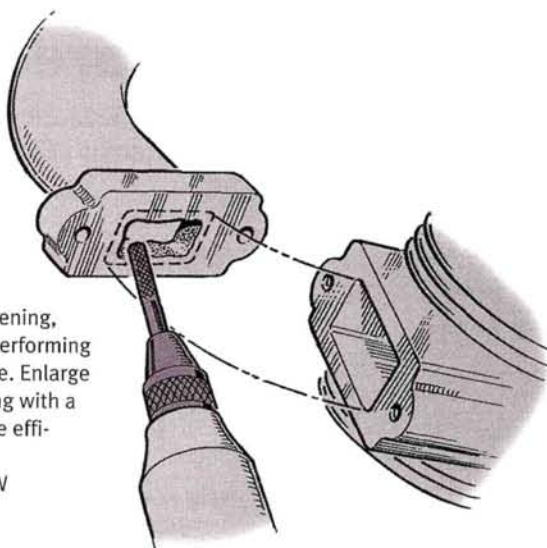
LUKE FAILLA
Merlin, OR



Free-Flowing Exhaust

If the opening in your exhaust manifold is smaller than the exhaust port opening, your engine is not performing as well as it could be. Enlarge the manifold opening with a Dremel tool for more efficient exhaust flow.

DR. MARIO BELTRAN
Yuma, AZ



Tighten that Belt

Many touring cars are not equipped with front belt tensioners; make your own with a slotted section of aluminum angle and spare bearings, as shown. Use the correct-size bolt for a slop-free fit in the bearings you choose, and secure the bearings with a nylon locknut. To install the tensioner, drill the bracket to match existing holes in your car's chassis.

CURTIS BROOKS
N. Las Vegas, NV

Bent Brush

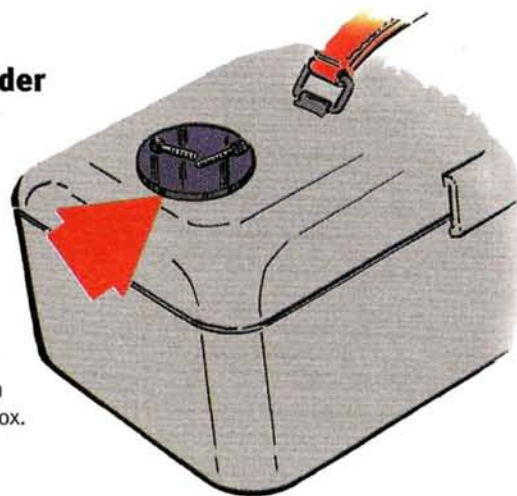
Everybody knows to keep an old toothbrush handy for cleaning those nooks and crannies, but sometimes a straight-handle brush can't get into the truly tight spaces. With the help of a candle flame, hair dryer, or heat gun, you can easily bend the brush into a more useful shape.

SONNY NEUFELD
Altona,
Manitoba,
Canada



Magnet Minder

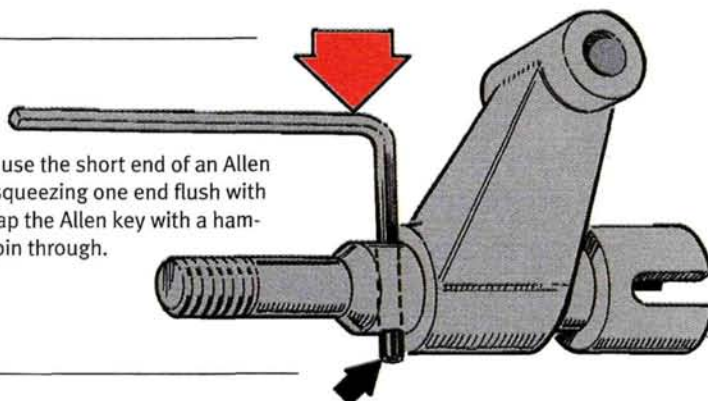
A pair of hardware-store magnets will easily prevent body clips or fasteners from being lost when you work on your car at the track. Use Shoe-Goo or a similar adhesive to hold the magnets in place on your toolbox. **JOE RODRIGUEZ**
Chicago, IL



Pin Pusher

To remove a stubborn roll pin, use the short end of an Allen key to press out the pin after squeezing one end flush with the axle with a pair of pliers. Tap the Allen key with a hammer or use a vise to push the pin through.

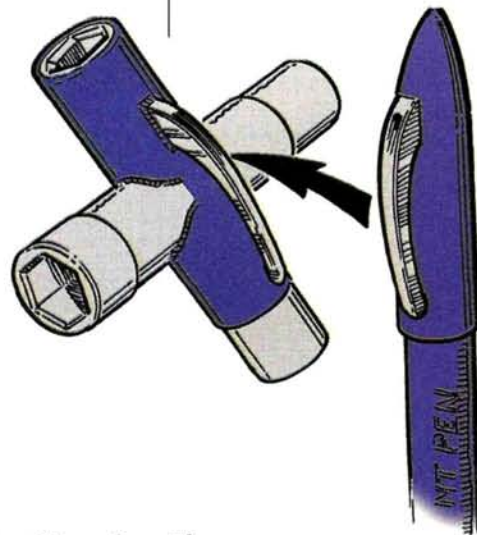
MATTHEW WONG
San Francisco, CA



Pocket Pal

Don't waste time fishing through your pockets for a 4-way wrench when emergencies arise; snap off the metal pocket-clip from a ballpoint pen and solder it to the wrench for easy pocket retrieval.

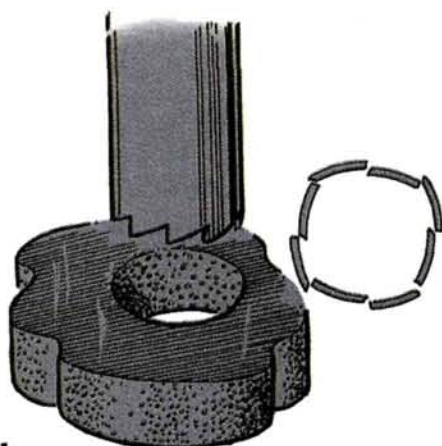
CLINT HALLER
Airdrie, Alberta, Canada



On the Hole

Don't tear up that foam bumper by poking holes through it with a screwdriver; cut a neat hole with a custom-made "plug cutter." File or grind stepped teeth into 1/4-inch brass or aluminum tubing (available at most hobby stores), bend the teeth slightly in alternating directions, then rotate the tool into the foam.

DAVE COWGER
Seattle, WA



USA-1 Steering Fix

You can easily reduce slop in your Kyosho USA-1's steering linkages by tightening a zip-tie around the servo-saver's spring collar. There's still plenty of servo-protecting "give" in the system, but steering is much more precise. You won't believe how well it works!

MARK SAVITSKE
Quakertown, PA



ROBINSON RACING PRODUCTS

TROUBLESHOOTING

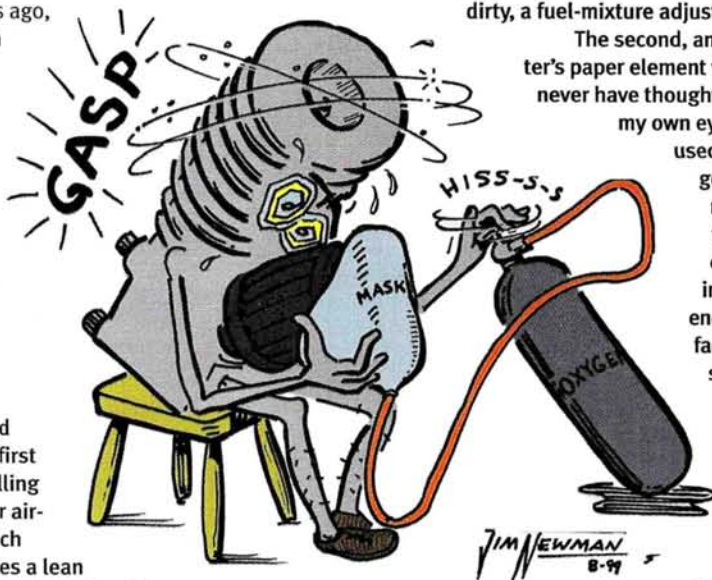
BY DOUG MERTES • ILLUSTRATIONS BY JIM NEWMAN

Heavy Breather

I have an RC10GT I bought a few months ago, and it ran fine until now. The air filter on my engine was getting pretty dirty, so I decided to replace it. Now I can't get the engine started. I bought the air filter from my hobby shop's experts, who said it was exactly the same as the one that came with the truck. It just seems weird that the engine was running perfectly five minutes before I installed the new filter, and now I can't get it started at all.

RICKY KENNEDY
Escondido, CA

I can think of only two things that would prevent your engine from starting. The first and most common problem when installing a new air filter is that it allows a greater air flow than the dirty one. It will allow much more air into the engine, and that creates a lean fuel mixture. If the filter you replaced was exceptionally



dirty, a fuel-mixture adjustment may be necessary.

The second, and unlikely, possibility is that the filter's paper element was installed upside-down. I would never have thought of this one if I hadn't seen it with my own eyes a couple of times. You said you used an identical replacement filter (a good choice, by the way), which is a round paper element with outer foam. The paper canister has two ends—one that allows you to see inside and another that is solid. The end of the canister with the hole should face downward into the carburetor. I've seen these filters installed upside-down so the solid end is down at the bottom; this completely blocks airflow to the engine. It seems like a silly mistake, but it's one that's easy enough to make if you're in a hurry. Check these two possible causes and I think you'll find the source of your problem.

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— Richard Saxton



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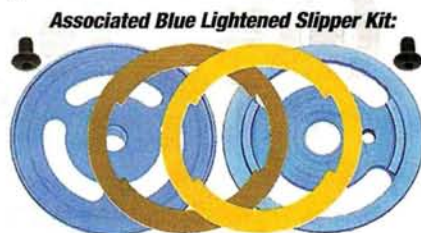
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RC10 GT Gas Spurs: Super tough and precision machined from heat-resistant plastic mesh flawlessly with our Clutch Bells. 32P in 61T thru 67T. RRP 2261 - RRP 2267.



Associated Blue Lightened Slipper Kit:

The rear plate is hard anodized to reduce wear and the front plate is color treated. The front plate is designed to hold the slipper pad forcing the pad to slip on the rear plate. When pad shows sign of wear just flip it over for a new surface. Metal parts are CNC machined for a flawless fit. RRP 1515.



Titanium Stealth Top Shaft: CNC Machined from a single piece of titanium, this super hard, super light shaft will fit any Stealth transmission. No serious race should do without this part. RRP 1512.

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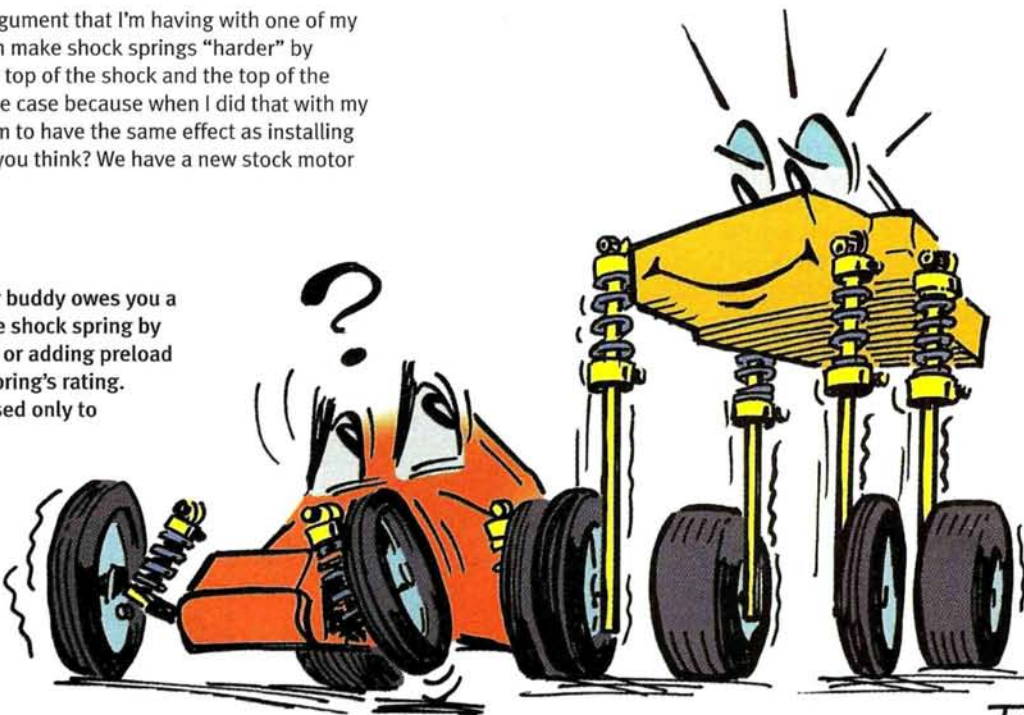


Think Spring

I hope you can resolve an argument that I'm having with one of my friends. He says that you can make shock springs "harder" by adding spacers between the top of the shock and the top of the spring. I don't think that's the case because when I did that with my off-road buggy, it didn't seem to have the same effect as installing stiffer springs did. What do you think? We have a new stock motor riding on your answer!

ALVIN WYCHESKI
Philadelphia, PA

Congratulations, Alvin; your buddy owes you a new motor. Compressing the shock spring by moving an adjustable collar or adding preload spacers won't change the spring's rating. Spring preload should be used only to set ride height, especially with off-road buggies and trucks in which minor adjustments to the vehicle's static ride height can result in handling changes. You should use just enough spring preload to give the ride height that works best for your track and your driving technique.



TIM NEWMAN
8-99

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Pinion Problems

Whenever I race my Associated T2 stadium truck, I wind up not finishing at least one heat because the pinion comes off the motor. I've chewed up a few spur gears because of this, but mainly, I'd just like to finish a race! It doesn't seem to matter which brand of pinion gear I use, and I always turn the setscrew until it starts to click, so I know it can't get any tighter. Few of the other racers have this problem, and nobody can help me figure it out, either. Do you have any ideas on this?

PHIL SPANTER
Sparks, NV

The clicking noise you hear when you tighten the setscrew is made by the worn tip on your Allen wrench. A semi-stripped setscrew might also click, but you say you've had this problem with many other pinion gears. Take a close look at the tip of your wrench; I think you'll find that its tip is stripped. A stripped Allen-wrench tip will have rounded edges on the hex where it's inserted into the setscrew. The

tip's rounded edges allow only limited torque to be applied before the wrench slips—the probable cause of your clicking noise. If the wrench is slipping, you can't get the setscrew tight enough and—voilà!—flying pinions. I bet the tool is the only thing you haven't changed yet!

If you plan to race seriously, you may want to invest in a high-quality pinion wrench with a carbide or steel tip. These are much stronger than the tools that came with your kit and are less likely to be damaged with repeated use. If you're short of money, carefully cut off the damaged portion of your existing wrench with a Dremel tool and a cutoff wheel. This gives it a fresh surface that should last until you've saved enough money for a new tool.



You Picked a Fine Time to Leave Me, Loose Wheel

I have a problem that started at the end of last summer, but lately it has become a real embarrassment. As often as two times out of three, a wheel on my Tamiya Mini comes off partway through a race. It isn't always the same wheel, and it isn't always at the end of the race, either. The wheels aren't broken; they just come off and roll down the track. Even if I tighten them down as hard as I can just before the race starts, they still come off. I've tried using new nuts, and that will solve the problem for a race or two, but it always returns to haunt me. I try to maintain my car well and even strip it down between heats to catch any developing problems, but this really has me concerned. What can I do to prevent my car from shedding wheels all over every track in town?

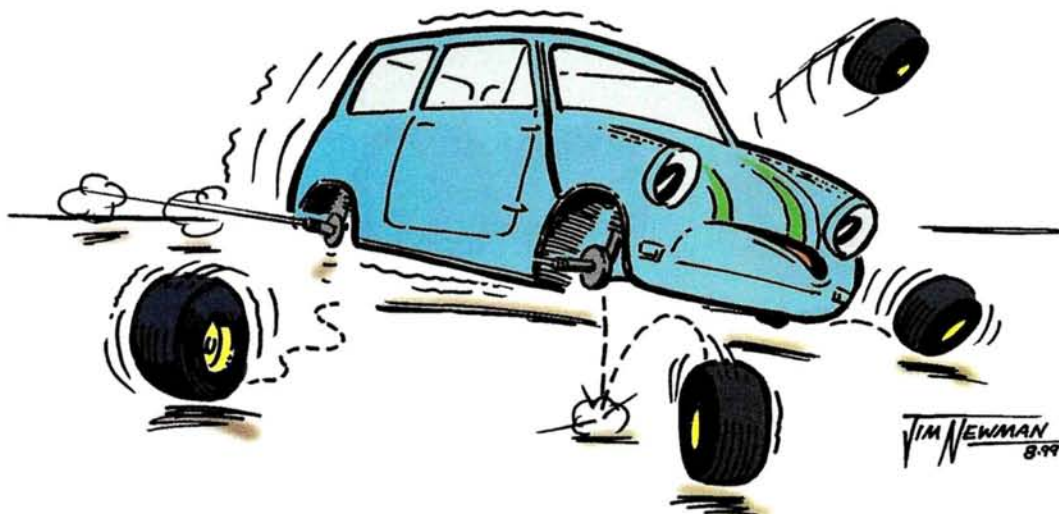
DAVE SAMOCADA
Tulsa, OK

Dave, I feel your pain. I had this problem about two years ago, but it affected only my front-wheel-drive sedan. At the 3- or 4-minute mark, one of my front wheels would take off down the track. Talk about embarrassing! After doing a little research among fellow racers, I discovered a few things about Tamiya wheels and axle nuts that were the cause of my problem.

I found that after only two or three runs, the "locking" portion of the nuts on my car had worn away and were virtually worthless. The locking device on these nuts is a thin strip of nylon or plastic that's inserted at the factory

and, apparently, it doesn't hold up well with repeated installation and removal of the wheel nuts. When the locking portion wears out, the nut simply loosens and then falls off. My first stab at a fix was to replace the wheel nuts every month or so.

Also, I measured all of my aftermarket sedan wheels and discovered that some of them, especially the chrome- and gold-plated ones, were just a smidgen thicker in the hex area than stock Tamiya parts. That meant that the axle nut wouldn't thread as far down on the axles when the aftermarket wheels were used, so less of the potentially problematic locking portion of the nut was exposed to wear.



The Right Tool for the Right Screw

We tend to think of our sedans and off-road vehicles as complete rolling chassis, but they're actually a collection of many small graphite, nylon, plastic and aluminum parts that are held in place by various fasteners. The purpose of this article is to familiarize you with the most common thread types, head configurations and uses for screws and threaded fasteners and also to cover the various types of tools that are used to install and remove them.

NICE THREADS

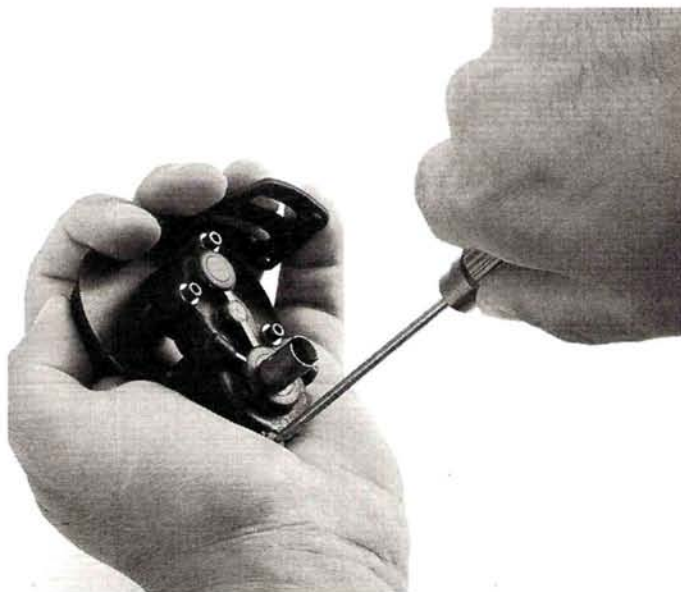
Two primary types of thread are used in R/C cars and trucks:

- **Self-tapping screws** have big, thick, coarse threads and are tapered to a point at the business end. They're used primarily to fasten things to soft plastic or nylon parts. These are different from wood screws because the threads are at a lesser angle (they're more horizontal), and the thread typically goes all the way up to the head. They're great for situations in which removal is infrequent, such as joining plastic gearboxes or other subassemblies.



The coarser thread of the self-tapping screw (left) helps it "bite" into plastic and other soft materials. The machine screw (right) has finer threads to accept nuts or threaded parts, but machine screws can be threaded into plastic as well.

- **Machine-thread screws** have much finer threads, and the shaft is the same diameter from top to bottom. These are often used with nuts or self-locking nuts, but they're also used when there's a tapped hole in precision-machined parts made of aluminum or steel. The smaller sizes aren't effective when connecting plastic to plastic because the threads are so thin. Larger diameter (8mm or 8-32 size) flat-head machine screws, however, are commonly used to fasten off-road buggy and truck tranny cases to the chassis tub. Even in that application, though, they can strip out if not properly handled.



When you need to bear down on a fastener, don't do it like this! If the screwdriver slips, you'll shish-kabob yourself.

HEAD CASES

Three common types of screw and bolt heads are used in our hobby: machined-head, flat-head and Allen-head. It's not unusual to find examples of all three on most radio-controlled chassis; that's because each has a unique purpose.

- **Button heads** are recognized by their rounded, hemispherical shape. These are the most common screw and bolt heads, and they're used in a wide range of applications. Because they have lots of "meat" around the slots, they're pretty



The decision to use a button-, flat-, or Allen-head screw depends on the location of the screw and the amount of stress it will be subjected to.

long-lasting and can withstand a substantial amount of torque from a ham-handed hobbyist. You'll often find them where flat, plate-type parts, such as an upper chassis deck, are mated to plastic or metal bulkheads or uprights, such as gearboxes or standoffs. The inset pattern on the head that mates with the screwdriver is usually a straight-slot or Phillips (also known as a cross-slot), but I've also seen some that mate with a special key; then there

are the Torx-type patterns used on Dutch Corally cars. Some Japanese cars use a self-tapping screw that has both a straight slot and a cross-slot. These work well in applications that need a lot of compression strength to prevent two parts from separating. Button-head screws with Allen-key patterns are another variation; they're smoother and lower in profile. Button-head fasteners can be either self-tapping or machine-thread types, and they come in both metric and SAE (American) thread patterns and sizes.

- **Flat-head screws** are beveled on the sides so

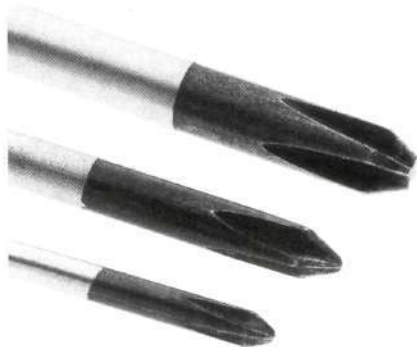
they'll fit flush with the surface when fully tightened into their matching, countersunk holes. Flat-head screws are used wherever clearance is critical to performance. They're most often found where drive belts pass close to suspension mounts, or where a smooth, finished surface is desirable, as on the bottom of chassis plates. The threads on a flat-head fastener can be either self-tapping or machine-thread. They come with Allen, Phillips, straight, or Torx-type driver patterns.

- **Allen-head screws and bolts** are the third type of fastener commonly seen by the R/C hobbyist. The head is shaped like a stubby column, with no size variation from top to bottom. Usually made of steel, hardened aluminum, or lightweight alloys such as titanium, these are installed when maximum strength is required. When a fastener will frequently be removed and reinstalled for maintenance or tuning purposes, there is no better answer than an Allen-head screw. In fact, the head is so strong and the torque potential so high that it's not unusual for designers to place a

R/C DOCTOR



Precisely ground or machined flat-blade screwdrivers are indispensable. These precision tips belong to a set of Hudy drivers.



Stay away from bargain tools with heads that "kinda" fit; correctly sized tools make all the difference. The no. 0, 1 and 2 tips shown here will handle just about every Phillips-head fastener in R/C.



Ball-type Allen screwdrivers allow you to sneak into tight spaces, but straight-cut Allen tools will be most resistant to stripping and rounding. Invest in a high-quality set of Allen screwdrivers; they make R/C more fun!

Take a few moments to inspect and measure the screwdrivers you're using and the condition of the screw heads on your ride. If they're not up to par, now is the time to replace them.

stress-spreading washer under them to spread the load on the parts that are being connected. Applications include motor screws (3mm thread), shock mounts (4-40 thread) and wheel bolts on pan cars.

You'll sometimes find flat-head-type screws that have a keyed head configuration. They seem to last longer than Phillips-type screws, unless they're hardened aluminum. I've never had much luck with aluminum flat-head screws; they seem to strip out very easily.

TOOL TIME

Each type of screw or bolt head requires a separate tool. It's really worth it to find and purchase the correct tool or to modify one that's pretty close in size so that it fits the screw head properly. Good tools last many years and result in a product that's better finished and has higher performance potential. You can easily spot a car that has been assembled or maintained with ill-fitting tools because the screw heads are all chewed up.

- **Slotted screwdrivers** come in many sizes and in an array of drive-tip thicknesses. Several companies, such as Craftsman, Wiha* and Hudy*, manufacture screwdrivers in a full range of sizes that are sure to fit your needs. You can get a good bite into a slotted screw head, but they need to be addressed head-on and can easily strip if the driver is used at an angle. Slotted drivers can also slip out of the head more easily and damage your fingers and palms, which is why you should never push down on a screwdriver to assemble parts you are holding in your hand; that's what the bench top is for. I have more than a few scars caused by slotted screwdrivers gone astray!

- **Phillips- or cross-head screwdrivers** also come in several sizes, but they use a much more commonly accepted numbering system.

The good news is that you don't find much variation in screw sizes from kit to kit, so I'd only worry about having three Phillips-head drivers. The ones I use most often are a zero point (small; very good for teeny wing screws, end-bell screws and Trinity* T-bar bolts), a 1 point (this medium size seems to fit Japanese machine heads best, but it's too long to fit shallow head notches; I cut off 1mm or so of the driver point so that it fits into the head properly), and a 2 point. Believe it or not, that big Stanley is one of the most used tools in my box, and it fits about 80 percent of the Phillips-head screws I encounter. One nice thing about the Phillips-pattern screwdriver is that the shaft is self-centering on the screw, so you don't have to realign the driver with every rotation. The bad thing, of course, is that they're easier to strip out than slotted or keyed screw heads. When a Phillips-head gets stripped out, the most effective way to remove it is to cut a slot in it (I have a small Dremel* cut-off wheel that I use for this) and use a straight-slot driver to carefully back it out.

- **Allen-head drivers** use a hardened-steel shank that fits very precisely in the screw head. Pinions and button-head screws accept either a 0.050- or a 0.062-inch driver, while 4-40-thread Allen heads require a 0.095-inch size. A motor wrench is a slightly larger 2.5mm size that drives the 3mm screw threads, and it gives you a much better grip on these critical components. Hudy, MIP* and Trinity make superior Allen drivers in those sizes, and they can be found in most hobby shops. Many hobbyists mistake a 4-40-size driver for a motor-screw wrench and wind up with slightly loose motor screws that back off the gear mesh partway through a heat. You can use a T-handle Allen driver for parts that are tightened into metal or large masses of plastic, but over the past several years, I've

switched to a screwdriver-type finger-tip handle, especially when tightening motor screws. My 2.5mm Wiha has a fingertip button that allows me to spin the wrench while holding it with one finger, and I haven't stripped out a motor can since I bought it! Bondhus* also makes an inexpensive driver that features a ball end. It lets you attack the screw head from an angle and still get a good grip. I really like Allen screws; they're great if you regularly remove a fastener for maintenance and repair. That's why I try to replace as many Phillips-head screws as I can with these types of fasteners. Try to avoid using the L-shaped keys that are included with most kits. These inexpensive tools are difficult to use. They also tend to develop rounded ends because they're made of cheap steel, so you think that the screw is worn out when in reality, it's the tool that no longer works properly. In a pinch, you can grind $\frac{1}{16}$ inch from the end of an L-shaped key to make it sharp again.

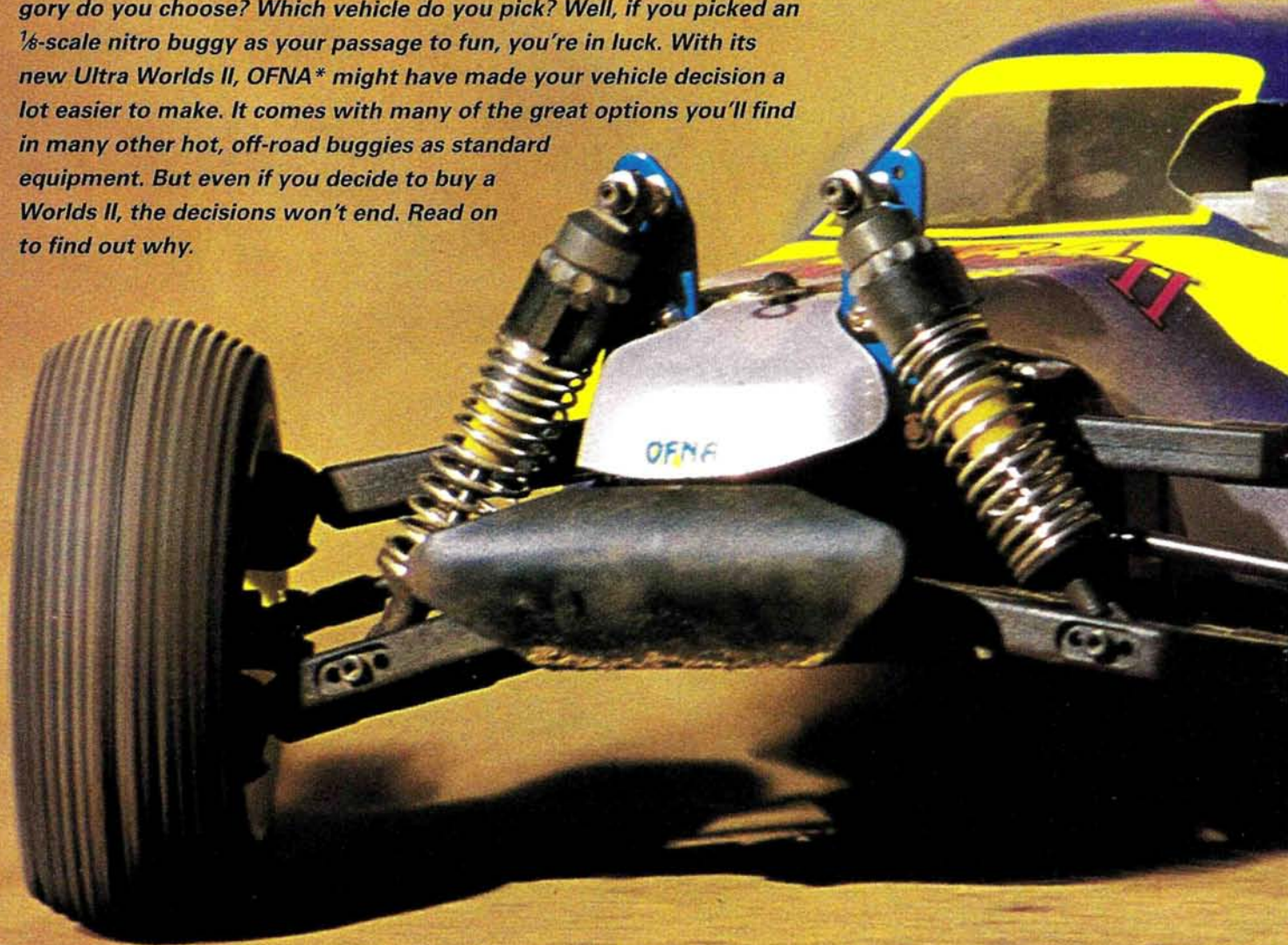
Note that all of these drivers are available in a variety of shaft lengths. I prefer a 3- or 4-inch shaft because this size fits in my box. Unless you have a specific need for it, don't bother to purchase a driver set with really short or really long shafts. Take a few moments to inspect and measure the screwdrivers you're using and the condition of the screw heads on your ride. If they're not up to par, now is the time to replace them. Otherwise, you may be stuck in the pits between heats, trying to figure out how to extract that ancient, stripped screw, rather than standing on the podium with a trophy in your hand!

**Addresses are listed alphabetically in the Index of Manufacturers on page 209.*

OFNA *Ultra* *Worlds II*

by Greg Vogel

Decisions; as if it weren't hard enough to make everyday life choices, we also have to make decisions on what we do for fun. Some people pick water-skiing, snow boarding, or biking; others pick R/C cars. But if you pick R/C cars, as with any other sport, the decisions don't end there. There are several categories of cars and trucks and many vehicles within each category. Which category do you choose? Which vehicle do you pick? Well, if you picked an 1/8-scale nitro buggy as your passage to fun, you're in luck. With its new *Ultra Worlds II*, OFNA* might have made your vehicle decision a lot easier to make. It comes with many of the great options you'll find in many other hot, off-road buggies as standard equipment. But even if you decide to buy a *Worlds II*, the decisions won't end. Read on to find out why.



TWO FRONT ENDS; ONE FAST BUGGY



s p e c s

WEIGHT

Gross, RTR 112 oz. (3,199g)

CHASSIS

Type Channeled plate
Material Aluminum

DRIVE TRAIN

Type Shaft
Primary Clutch bell/spur
Drive shafts (F/R) Universal/ dogbones
Differential(s) Bevel gear
w/molded housings
Bearings/bushings Bearings
Clutch 3-shoe

SUSPENSION

Type Double A-arm/lower
arm with adjustable
upper link

Damping Oil-filled coil over

WHEELS

Front/rear One-piece plastic

TIRES

Front/rear Double X-pattern
w/foam

POWERPLANT

Motor O.S. RZ-V 99
(not included)
Pipe OFNA aluminum
Manifold OFNA

SCALE 1/8
LIST PRICE \$534.95

DIMENSIONS (chassis only)
Length overall 19.25 in. (489mm)
Wheelbase 10.5 in. (267mm)
Width (F/R) 7.25/7.75 in.
(184/197mm)

KIT FEATURES

• **CHASSIS.** I was impressed as I inspected the 4mm-thick, gray-anodized chassis. It incorporates front kick-up and channeled sides that make a solid, functional foundation; not only are all the screw holes countersunk, but the engine slots are, too. Plastic dirt shields attached to each side of the chassis keep out dirt and debris. An upper brace/servo tray no longer spans the length of the chassis. Now, there's a radio box mated with a shorter servo tray on the chassis' right side. The radio box houses the receiver battery, receiver, switch and antenna mount. Two tie rods that run from the upper steering brace and the rear bulkhead to the chassis help to eliminate chassis flexing.

• **DRIVE TRAIN.** New O-ring-sealed diffs replace the old grease-filled units. The hardened-steel gears inside the diffs are also new and should hold up better than the old, pot-metal gears. These new diffs may be filled with heavy silicone fluid to control their action.

Like the rest of the drive train, each differential rides on large, smooth ball bearings. Dogbones transfer the power from the center diff to the front and rear diffs. Dogbones are also used to drive the rear wheels.

Up front, there are CVA universals; the cup of each is attached to the wheel axle, and the ball joint is on the shaft (unlike other similar units). The aluminum wheel adapter is pinned to the axle, and a setscrew holds the pin in place—a little extra security; nice touch. Steel brakes with padded shoes have made their way onto many high-performance vehicles, but the Worlds II has four instead of the usual two. Actuated by cams that are supported by ball bearings on top, there are two for the front discs and two for the rear.

• **ENGINE ACCESSORIES.** A flywheel machined for a 3-shoe clutch, a clutch bell and all the hardware needed to bolt in an engine are included. Unlike a few other off-road buggies, the Worlds II comes with an exhaust system. A manifold, retaining spring, gasket, coupler and pipe with pressure tap are ready to be bolted to any engine. OFNA supplies a 3-shoe clutch to fit many popular engines, but I had to buy a flywheel spacer for my O.S.* engine. A new 125cc fuel tank sits across from the radio tray. The pressure line is attached to the flip-top cap; the fuel pick-up is in the back of the tank and features an in-tank filter.

• **SUSPENSION.** Would you believe me if I told you that the



Worlds II comes with two types of front end? Well, it does—an MP-5 style and an MBX-4 suspension system; you have to decide which one suits your driving style and track. Both units are linked up to the pivots on the front bulkhead.

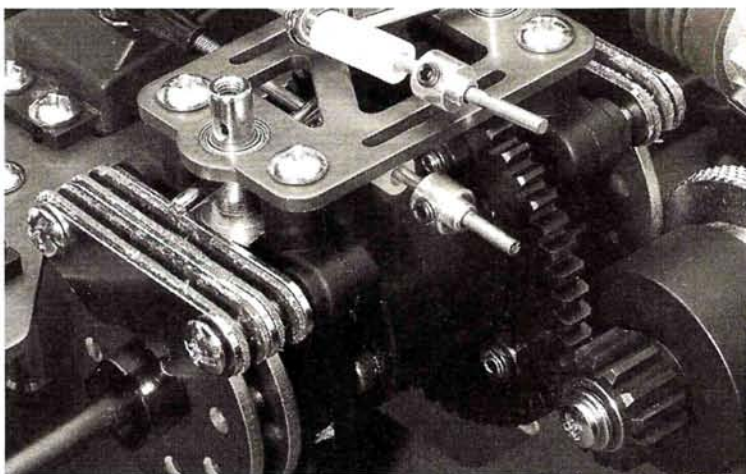
The MP-5-style front end is a double-wishbone type with an adjustable-tie-rod upper link. A stout hub carrier and a cast steering knuckle round out the MP option.

At the end of the upper and lower arms, the MBX-4-style front end has large pivot balls mated to a large steering knuckle. Some pivoting suspension systems use aluminum screws to hold the knuckle; an aluminum screw pivoting on the metal ball can wear quickly; OFNA provides a concave plastic spacer that eliminates the metal-to-metal contact.

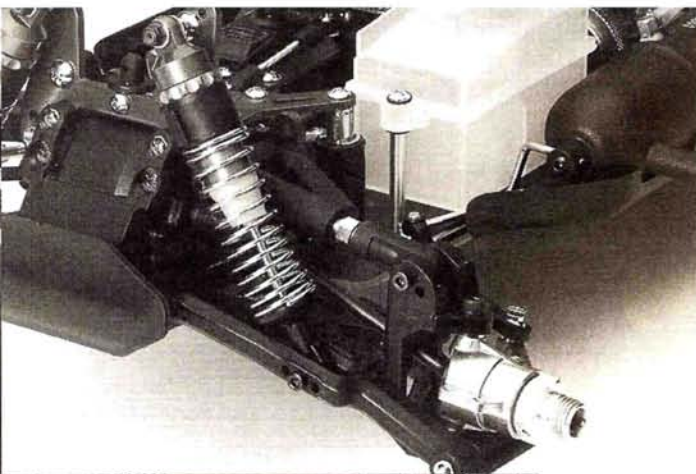
In the rear, the Worlds II has downswept suspension arms to increase downtravel. An adjustable upper camber link is bolted to the hub carriers and shock tower. Several holes in the tower and carrier allow fine adjustments to be made.

Damping is handled by gray-anodized, aluminum-body shocks. The double-O-ring seals are bottom loaded and protected from debris by yellow rubber boots that fit tightly over the shock shafts and shock bodies. Several molded-plastic clips of various sizes allow ride-height adjustments. New steel shock standoffs space the shock away from the towers.

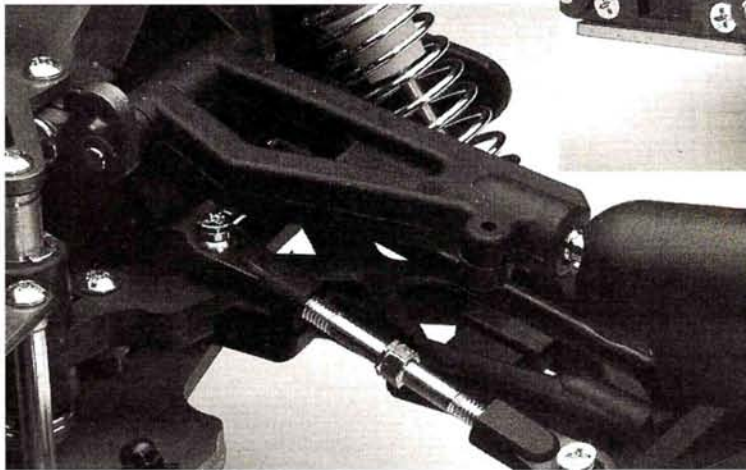
• **TIRES, BODY AND WING.** To lay the traction down, X-pin tires complete with foam inserts are mounted on yellow, 5-spoke rims. The bright wheels are matched to a flexible yellow wing that provides enough rear downforce to keep the car planted on the track and flying level through the air. To cover it all, the Worlds II is topped off by a new body with similar curves to OFNA's older buggy bodies.



Above: all the goodies you see here are stock equipment on the Worlds II: vented disk brakes, ball-bearing-supported brake cams, a sealed diff and a steel main gear. Inside the diffs are new, hardened-steel bevel gears. They can withstand as much abuse as you can throw at them. The same holds true for the main gear and clutch bell.



Above: the Worlds II comes with an MP-5-style front-suspension system. When you get a handle on the car's assembly, you'll be able to swap the front ends in minutes.



Above: the rear suspension has the same arms and pivot block as its predecessor, the Ultra Worlds GT. An adjustable upper link allows camber adjustments, and there are tons of link-mounting holes for fine tuning. Way to go, OFNA!

Left: spring-loaded bellcranks and adjustable turnbuckles are standard equipment. This front end is highly adjustable—caster, camber, track and toe.

BUILDING & SETUP TIPS

Because I had convinced the folks at OFNA to send a prototype of the Worlds II as soon as they had a drivable sample, the car was sent without instructions. The following tips were discovered during my trial-and-error buildup, but the factory instructions should address the glitches I encountered.

■ To fill the diffs with oil, first assemble the case with the gears and screws installed. Then add oil until it reaches the top; place the bevel gear with the output gear into the case. Push the bevel gear all the way in; you'll notice that the four retaining screws that hold the diff together will slide out of the back of the case. Holding the two halves together firmly, turn the assembly over, and screw the four screws back in. Tighten each a little at a time in a "cross pattern" to avoid over-tightening them. Keep tightening them until you feel very slight gear binding. This will vanish as the gears are broken in.

I used OFNA silicone oil in the diffs:

- 7,000WT up front.
- 10,000WT in the center.
- 5,000WT in the rear.

■ When you install the tie-rod chassis stiffeners, make sure that they slide into place easily without having to be forced. If you force them, they will bend the chassis. To check the chassis, hold the edge of a metal ruler to the bottom of it, and you'll see immediately whether it is being bent. Adjust the tie rod until the chassis is flat.

■ Lose one of the rear brake disks. OFNA supplies four—two for the front and two for the rear. Unfortunately, when I installed the engine, I found that the flywheel hit the second disk and didn't allow proper gear mesh, so I used only one rear disk.

■ The radio box didn't drop right in; I had to modify it slightly with my Dremel* Moto-tool. I trimmed the box to clear the lower rear-suspension pivot and stiffening brace. I had to cut a small piece of plastic away from the dirt shield to clear the front of the box.

YOU'LL NEED

- 2-channel radio system (preferably FM).
- 2 high-torque servos.
- Receiver pack.
- Engine.
- Starter box.
- Glow-starter.
- Fuel.
- CA glue.
- Paint.

FACTORY OPTIONS

- Torsen front diff—part no. 10605.
- Torsen center diff—10606.
- Teflon shock pistons (assorted sizes)—32235.
- Titanium shock shafts (F/R)—32238/32239.
- Red spring set—32330.
- Yellow spring set—32340.
- Aluminum CNC knuckle—36512.



TEST GEAR

O.S.* .21 RZ-V 99 engine • Futaba* 3PJ radio and receiver
• Futaba digital steering servo (S9450) and throttle servo (S9402) • Trinity* fuel

PERFORMANCE

During the building stages, I had to decide which of the two front ends I should attach to the buggy. I had previously been driving an MBX-4 so I bolted up OFNA's MBX-4-style front end to see how the two vehicles would compare. I'll bolt up the MP-5 front later and see how well it performs.

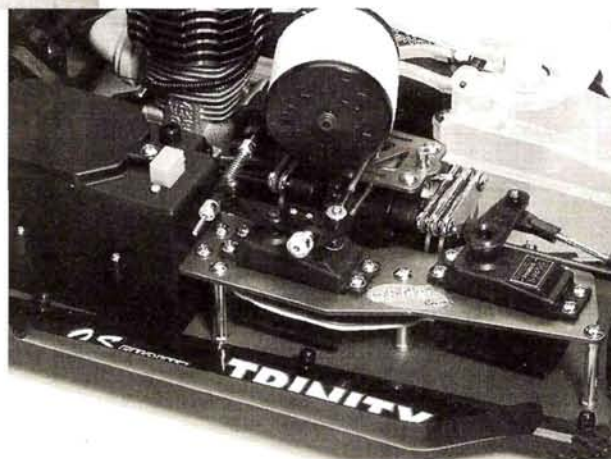
Xtreme R/C in New Milford, CT, host of many of R/C Car Action's track tests was where I tested the Ultra Worlds II. I arrived there ready to run because I had broken the engine in at home and was prepared for a full day of racing. I arrived early to get some practice time. I first took a few slow laps to get used to the track layout, and then, when I had a handle on how I should take the jumps and where I should enter and exit the turns, I yanked on the throttle.

I wasn't surprised that the buggy was fast—after all, it is powered by a .21 engine—but I did notice that low-end acceleration is quick and controllable.

Then I hit some rough areas and turns. The buggy was tossed around and hooked in the corners. I knew I had to hit the bench for a shock-tuning session. The kit oil was obviously too light—somewhere near 30WT, I estimated. I decided to try 35WT up front and 45WT in the rear, and I added MIP springs to all four shocks.



Here's the MBX-4-style suspension setup. Many racecars use this pivot-ball and steering-knuckle setup because it works very well. I opted to stick with it for racing.



The new, blue-anodized radio tray is much shorter than the old one and is supported by aluminum standoffs. Now it houses only the servos; the radio box holds the battery, receiver and switch.

THE COMPETITION

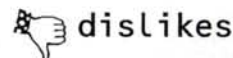
	OFNA ULTRA WORLDS II	Kyosho MP-6	Thunder Tiger EB4	Mugen MBX-4
Wheelbase	12.92 in. (323mm)	13.3 in. (331mm)	12.96 in. (324mm)	13 in. (325mm)
Width	12.02 in. (305mm)	11.93 in. (318mm)	10.6 in. (265mm)	12 in. (306mm-310mm)
Weight	112 oz. (3,199g)	113 oz. (3,212g)	115.5 oz. (3,300g)	119 oz. (3,400g)
Diff type	Sealed	Sealed	Sealed	Sealed
Brakes	Steel	Steel	Steel	Steel
Exhaust	Pipe	Not included	Not included	Not included
Available at**	\$369.99	\$449.99	NA	NA

**Prices vary with location



- Includes two types of front-suspension units.
- Stainless-steel brakes.
- Exhaust system is included.

- CVA front universals.
- Sealed diffs.
- It's fast and it's fun.



- You might have to do some hand-fitting to install the radio box.
- Had to remove one rear brake disk to allow the engine to fit.

- The steering bellcranks are a little flimsy.

Back on the track, the buggy felt planted. It didn't slap the bumps or toss itself around; it launched level off jumps and absorbed the rough stuff. It also handled the turns better. When I drove my MBX-4 at Xtreme R/C, I had driven hard through the corners, as I would with a 1/2-scale car. The Worlds II also exhibited similar excellent steering: I was able to enter the turns hard and exit with the throttle pegged.

I went back to the pits to make a front-end change. It took all of about 20 minutes to make the swap to the MP-5-style suspension, and I set the front end to zero toe and -2 degrees of camber. I fired up the buggy for a quick practice round before the racing began. The MP-5-style front end also kept the buggy planted firmly through the rough stuff and felt much more stable when landing off killer jumps. I did notice, however, that I wasn't able to cut through the turns as quickly; I had to use a little more braking than before, and that slowed my lap times.

THE WRAP UP

OFNA has gone out of its way to give you more for your money. Which other kit supplies you with two of today's most popular front-end suspension designs? Whether you run for fun or race

for a trophy, having that choice is a big benefit. Tuning the car to your track or backyard has never been easier. And to all you backyard bashers out there who drive your cars to the max and frequently destroy a front arm or axle carrier: no sweat. Go to your parts box and drop in a new front suspension system.

My only gripe concerns the look and durability of the material used: it's a softer plastic

and doesn't have the strong, finished look that more expensive 1/8 buggies have. Overall, however, the Worlds II is an excellent buy that will fit the needs of backyard bashers and weekend racers.

*Addresses are listed alphabetically in the Index of Manufacturers on page 209.

Kyosho **Lazer** **2000**



Bashin' buggy

by Mike Henry

Do you remember why you first got into R/C? Was it because you just had to have the latest version of the car that won the IFMAR Worlds? Or, did you have a few extra mod motors taking up space on your workbench? Probably not. More likely, it all started with a three-letter word: fun. And Kyosho* firmly pushes the fun button with the Lazer 2000. This 4WD, electric-powered, 1/10-scale vehicle is aimed squarely at beginners but has some unexpectedly trick features, such as full-time, belt-driven 4WD and oil-filled, coil-over shocks, just to mention a few. The kit comes 80-percent assembled and needs only a 2-channel radio, two servos and a stick-type Ni-Cd battery pack to get things rolling. Is it up to beginners' bashing abuse? I aim to find out.



s p e c s

SCALE	1/10
LIST PRICE	\$139.99
DIMENSIONS	
Length overall	17 in. (432mm)
Wheelbase	10.8 in. (275mm)
Width	9.5 in. (240mm)
WEIGHT	
Gross, as tested	56.6 oz. (1,605g)
CHASSIS	
Type	Molded tub
Material	Kelron (ABS plastic)

DRIVE TRAIN	
Type	Dual belt
Primary	Pinion/spur gear
Drive shafts	Dogbones
Differential(s)	Gear
Slipper clutch	None
Bearings/bushings	Bushings

SUSPENSION (F/R)	
Type	Lower A-arm w/fixed camber link
Damping	Plastic oil-filled shocks

WHEELS	
Type	One-piece plastic
Dimensions (DxW)	54x35mm

TIRES	
Type	Kyosho "Sand Super" lugged tread

ELECTRICS	
Motor	540 sealed endbell
Battery	Not included
Speed control	3-step mechanical w/reverse

KIT FEATURES

• **CHASSIS.** The Lazer 2000 features a molded Kelron chassis. Although not the lightest material, it certainly is strong. The somewhat odd shape of the tub makes maintenance a bit awkward. A short brace lends extra stiffness to the nose of the buggy, while a molded "spine" encloses the front drive belt and features a taped-on Lexan cover. A plastic battery tray holds the required stick pack securely—maybe too securely; pack changes were difficult. A swing-away "door" would help; Kyosho's design calls for the arms that hold the pack in place to be "flexed" out of the way. Up front, a huge, '80s-flashback bumper screams "Thrash!" and completes the chassis.

• **DRIVE TRAIN.** The included 540-type motor is standard fare for a kit in this price range. It provides plenty of torque and, more important, lots of run time. The Lazer uses a 48-pitch spur gear and a 19-tooth pinion gear. Full-time 4-wheel drive is delivered via a dual-belt drive system. The belts are enclosed to help keep out dirt and flying debris. The front belt seems unusually loose, but since no tensioning device is provided, it was left as is. The Lazer features gear differentials at both ends of the drive train. Four dogbones get the power to the wheels, and the drive-train parts spin in metal bushings while the hub car-

riers use plastic bushings. The kit includes Kyosho's "Heavy-Duty" three-step rotary speed control, which is effective although a bit antiquated by modern R/C standards. I replaced the mechanical speed control with a Novak electronic unit.

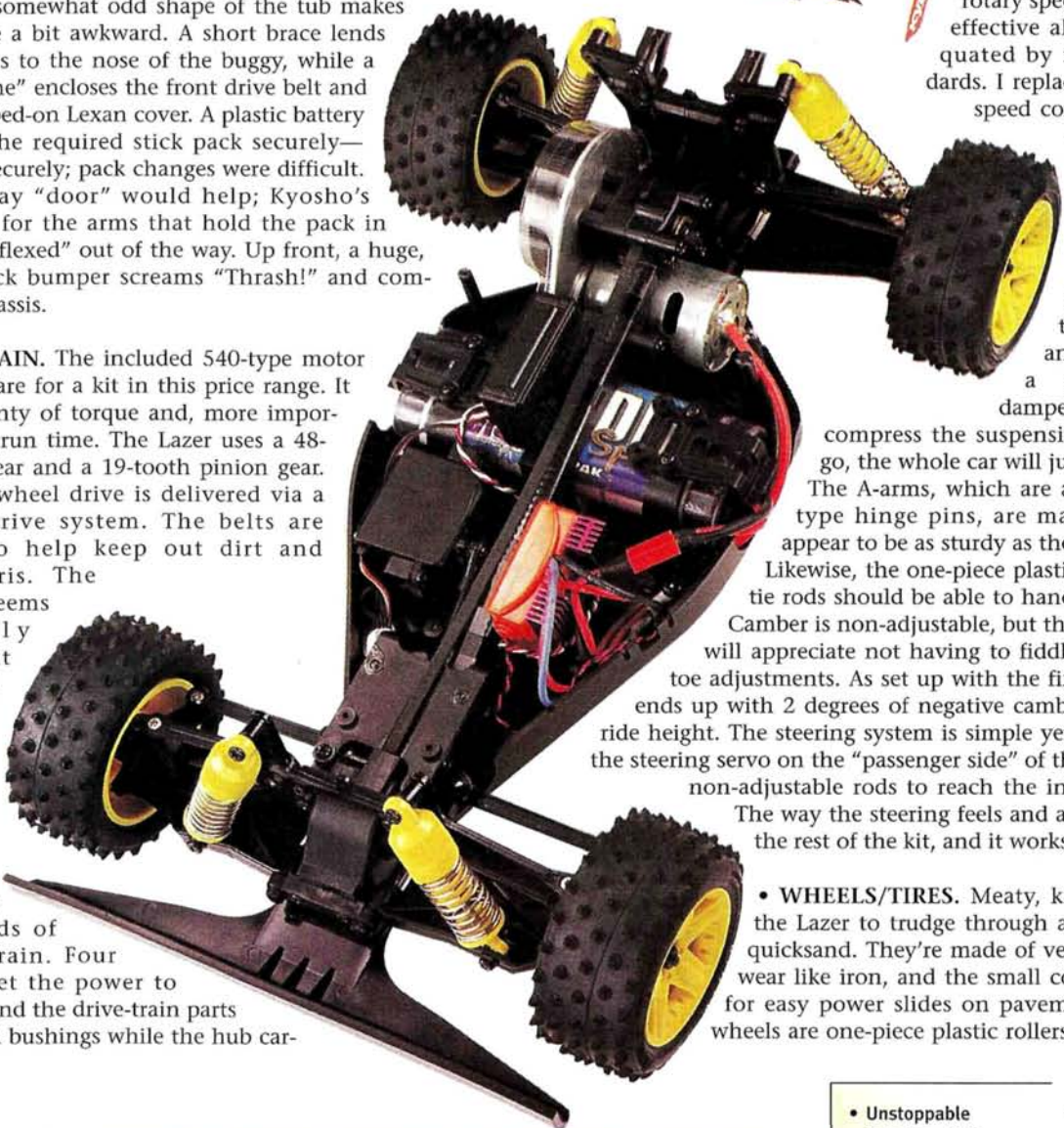
• **SUSPENSION.**

Kyosho provides oil-filled, coil-over shocks in the kit. Unfortunately, the stock pistons and shock oil deliver a bouncy, under-damped ride. If you fully

compress the suspension and quickly let go, the whole car will jump off the ground! The A-arms, which are attached via screw-type hinge pins, are made of Kelron and appear to be as sturdy as the rest of the chassis.

Likewise, the one-piece plastic camber links and tie rods should be able to handle plenty of abuse. Camber is non-adjustable, but that's OK. First-timers will appreciate not having to fiddle with camber and toe adjustments. As set up with the fixed links, the Lazer ends up with 2 degrees of negative camber at the suggested ride height. The steering system is simple yet effective. It places the steering servo on the "passenger side" of the tub and uses two non-adjustable rods to reach the included servo-saver. The way the steering feels and acts is on a par with the rest of the kit, and it works quite well.

• **WHEELS/TIRES.** Meaty, knobbed tires allow the Lazer to trudge through any terrain short of quicksand. They're made of very hard rubber and wear like iron, and the small contact patch makes for easy power slides on pavement. The provided wheels are one-piece plastic rollers—a departure from



BUILDING & SETUP TIPS

Sure, the Lazer arrives 80 percent assembled, but that means 20 percent of it still needs to be assembled before you hit the track! Here are some steps to watch out for and a few tips:

■ **Step 2.** Make sure the steering servo's output shaft is centered before you install it in the chassis. Because of the servo's orientation, there is no access to the servo-horn screw once it has been installed.

■ **Step 6.** The Lazer 2000 comes with a mechanical rotary speed control, but I highly recommend an ESC. An ESC not only delivers power more smoothly and efficiently, but it also enables you to lose the weight of an extra servo and the myriad wires needed for the rotary unit. That resistor gets darn hot, too!

■ **Step 17.** Kyosho provides a clear protective film on the outside of the Lexan body. This is especially useful for junior modelers, and it's a nice touch. Simply cut the lines on the body, affix the provided window masks and shoot it (with paint, of course!). Just be sure to hold off on applying the decals until you've removed the film.

■ The gear mesh was too loose on my Lazer; it made an awful clicking sound on full-throttle acceleration. All was well after I had properly set the gear mesh. I then checked the rest of the kit for loose hardware (good advice for any factory-assembled kit).

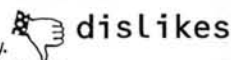
■ If you install the provided preload adjusters (4mm on front shocks, 6mm on rears), the suspension's tendency to bottom out can be reduced.

■ To avoid attracting dirt and grit, do not grease the dogbones and drive cups; instead, use a "dry" lubricant such as Great Planes'® Finish Line Teflon lube.

- Unstoppable full-time 4WD.
- Rugged (hack-proof) construction.
- Low price.



- Oil shocks bottom out harshly.
- Awkward battery changes.



YOU'LL NEED

- 2 standard servos (or one servo and ESC).
- Polycarbonate-compatible paint.
- 6-cell stick-pack battery.
- Charger.
- 2-channel radio set.

FACTORY OPTIONS

- Long Sport shocks (2)—part no. KYOC3610.
- Short Sport shocks (2)—KYOC5842.
- Bearings (pair): 5x10 (4 pairs required)/8x14 (2 pairs required)—DTXC1535/DTXC1583.



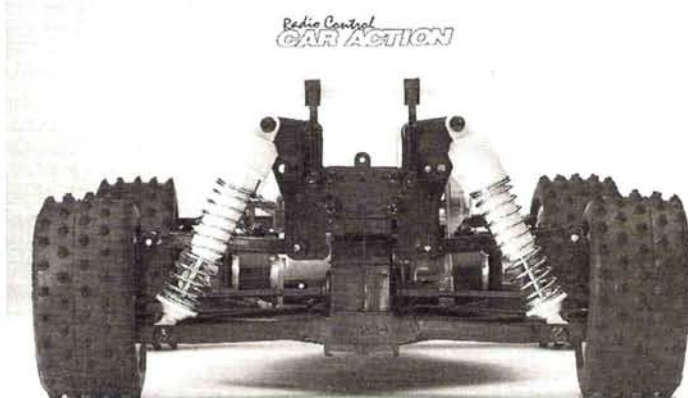
TEST GEAR

• Novak* Duster II Sport ESC • Futaba* S3003 steering servo
• Futaba Magnum Sport transmitter and receiver • Trinity* Amp
Max II battery • Race Prep* Outlaw Stock Motor

previous Kyosho sport buggies that relied on three-piece clamping rims. I've never been a big fan of three-piece wheels, so it's nice to see that Kyosho is moving away from them.

PERFORMANCE

I took the freshly assembled Lazer to a local park for some thrashing. The supplied 540-type motor provides plenty of run time, but its power output is barely satisfactory. First-time R/C'ers won't be comparing the buggy with any mod-motor experiences, and the supplied motor should keep them happy until they learn to drive well, but it won't be long before even the greenest newcomer is yearning for more speed and power. Despite the buggy's mild power output, the combination of 4WD and beefy step-pin tires allowed the Lazer to run over everything in its path.



Long-travel plastic shocks suspend the Lazer and use clip-on spacers to adjust preload and ride height. You'll need 'em; the Lazer needs all the ground clearance it can get to compensate for its under-damped suspension. Note the positive camber at full ride height

Handling is very neutral, and I found it nearly impossible to get the buggy to over-steer on anything short of pavement.

The shocks do their job, but the suspension is severely under-damped and prone to bottoming out. It doesn't seem to faze the car at all, but you'll have to get used to the sound of the chassis scraping the ground. To duplicate the sort of "what-ever's-lying-around" action the Lazer is likely to see, I built a 2-foot-high jump using some scrap materials. No

matter how I approached the jump, the Lazer slapped hard on landing, but to its credit, it soldiered on, even after repeated abuse.

I wanted to test the Lazer on a groomed track, but I knew that the kit motor wouldn't have the speed

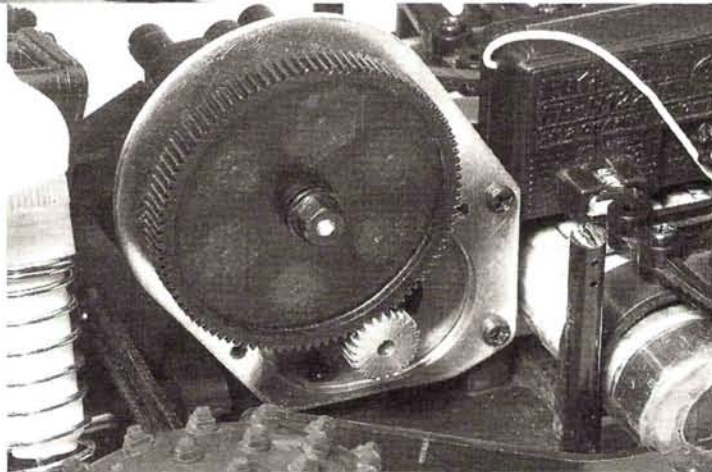
to bring out the best (or worst) the Lazer had to offer, so I fired up my soldering iron and strapped in a Race Prep* Outlaw stock motor. This transformed the buggy into a real screamer and made great use of the 4WD. The Lazer carried a lot of speed through the fast sections and was surprisingly easy to drive. The neutral handling was still present at the track, but the kit's Achilles' heel appeared again: the chassis scraped the ground when traversing anything more taxing than mildly bumpy terrain. Even with the ride height maxed out, the Lazer was prone to bottoming out. Thicker shock fluid would certainly help, but stiffer springs are the real must-haves. Kudos to Kyosho, as the buggy showed no signs of wear and tear from the hotter motor and the—perhaps—unfair racetrack abuse. I gave the Lazer a thorough inspection after running a few packs through it; unsurprisingly, the chassis was covered with scrapes, but nothing else looked any worse for wear. The front drive belt was extremely loose, but I never encountered any skipping, and the Lazer never threw a belt. It's tough!

CONCLUSION

I'd like to see Kyosho add stiffer springs and a faster motor to the Lazer 2000, but overall, the car is good example of a solid, entry-level machine. The Lazer survived a few hours of premeditated mistreatment and rewarded me with an afternoon of grins. I found myself going out of my way to create new obstacles, jumps and anything else in an attempt to slow it down. If your idea of

fun is thrashing and you think that "discharging a battery" has something to do with actually running your car instead of powering up light bulbs in the pits, the Kyosho Lazer 2000 is worth a look.

*Addresses are listed alphabetically in the Index of Manufacturers on page 209. ■



Be sure to check the pinion/spur gear mesh before you hit the dirt; the spur gear is specific to the Lazer, and you'll be sidelined if you strip it. The substantial aluminum motor plate is a welcome touch on an entry-level vehicle.



Schumacher **Nitro .21 Xtreme Touring Car**

by Kevin Hetmanski

Although R/C cars are similar to their full-scale counterparts in many ways, when it comes to high-performance cars and horsepower, R/C machines diverge sharply from "the real thing." In the full-scale world, many cars showcase a powerful engine as the source of their performance potential. On the R/C scene, the chassis is king, and horsepower is added later when you choose a motor or an engine.

Schumacher's* go-fast recipe is closer to the full-scale pattern established by '60s muscle cars: cram maximum horsepower into a "minimum" chassis. The Nitro 21 Xtreme is one result of this philosophy, and it's reviewed here in touring trim (it's also sold as a truck). It's the industry's only .21-powered, 1/10-scale car, and that means it weighs about 4 pounds and has an engine that's typically used to power cars weighing about 8 pounds. With that kind of power-to-weight ratio, it can't help but be fast. The question is: how fast?

ORBITAL OPEL



s p e c s

SCALE 1/10
LIST PRICE \$539
STREET PRICE \$319.50

DIMENSIONS
Wheelbase 10.6 in. (270mm)
Width 12.2 in. (310mm)

WEIGHT
Gross, RTR 78.9 oz. (2,248g)

CHASSIS
Type Tub
Material Stamped steel

DRIVE TRAIN
Type Sealed belt
Primary Clutch bell/spur gear
Drive shafts Plastic telescoping universals
Differential Ball
Bearings/bushings Ball bearings

SUSPENSION (F/R)
Type Lower A-arm with adjustable upper link
Damping Oil-filled, coil-over shocks

WHEELS
Type 3-spoke plastic
Dimensions (F/R, DxW) 2.2x0.87/2.2x1.5 in. (56x22/56x38mm)

TIRES
Type Schumacher V-lug

ENGINE
Model Thunder Tiger Pro 21
Carburetor Slide type
Pipe Schumacher aluminum tuned type



KIT FEATURES

• **CHASSIS.** Any car with this much power needs a strong backbone. Schumacher delivers with a rugged, stamped-steel chassis that could take a hit from a nuclear bomb! Steel is not light, but who cares? With the awesome power of a .21-size engine bolted into it, chassis weight is not an issue! All of the holes on the chassis' bottom have been countersunk, and raised sides form a low tub and further stiffen the chassis. A bright yellow powder-coat finish prevents the chassis from rusting and lends hot-rod appeal.

• **SUSPENSION AND STEERING.** The Xtreme borrows its suspension system from Schumacher's Cougar line. It's a conventional lower A-arm/camber-link setup with fiberglass front and rear shock towers and plastic, oil-damped shocks. The shocks feature Schumacher's Vari-shock adjustable pistons and, as assembled by the factory, they operate well. The suspension does seem a bit spindly for a .21-powered vehicle, but for on-road work, it should hold up well enough.

A standard, two-piece bellcrank steering system keeps the tires pointed in the right direction. The servo-saver included in the kit is kind of cheesy; it works, but the parts are rough and flexible. Go down to the local hobby shop and invest in a good Kimbrough* servo-saver; it will be well worth the few bucks.

• **DRIVE TRAIN.** Power is transferred from the engine to the gearbox via a 48-pitch clutch bell and spur gear. This seems like an awfully fine pitch for a car with so much power and no slipper clutch. Only time will tell whether these gears are up to par. The transmission's top shaft drives a ball differential via a smooth running belt, and telescoping universal drive shafts spin the rear wheels. A fiberglass disk brake appears to be capable of hauling the car down effectively, and you will be happy to know that a full set of ball bearings is included in the kit to keep the rotating parts running smoothly.

• **ENGINE.** The typical 1/10 nitro car includes a .12 engine, or maybe a .15, if you're lucky. Schumacher specs a Thunder Tiger

Pro 21R, which is like putting a blown V-8 in a Corolla. I run an identical Thunder Tiger engine in my 1/8-scale racing buggy with good results, so a 1/10 chassis will hardly challenge the engine. A large, slide-valve carb gives the throttle a responsive feel, and a heavy-duty pull-starter eliminates the need for a starter box. A manifold and small tuned pipe handle the exhaust.

• BODY, TIRES AND WHEELS.

The Xtreme's large Opel Calibra body takes great liberties with scale to accommodate the wide-track chassis, but it is a good-looking caricature of the popular tourer. I painted the shell with Parma's* Faskolor water-based paint. This was my first experience with Faskolor; I like it! The Xtreme's attractive, 3-spoke wheels hold rally-type, V-tread tires. The hard compound and lug-like tread doesn't seem to be the right combination for the Xtreme's horsepower, but the tires do look as though they'll wear well.



BUILDING & SETUP TIPS

Since the Nitro .21 Xtreme arrives almost fully assembled, there isn't much building to offer tips on! But here are some good pointers that apply to any nitro vehicle.

■ Check the car for loose fasteners before the first run and in between tanks of fuel. All nitro-powered cars are tough on hardware, but .21 engines are particularly capable of shaking out screws.

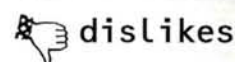
■ Break in the engine properly; all it takes is a little patience. Run the car rich for at least three tanks of fuel before you begin to lean out the mixture. If the exhaust doesn't emit a blue smoke trail during those first tankfuls, your mixture is too lean.

■ Keep an eye on the gear mesh. The Xtreme's 48-pitch gears are much finer than the 32-pitch gears typically used on nitro vehicles, and they're less tolerant of sloppy mesh. Use Loctite* on the engine-mounting screws and tighten them firmly. While you're at it, apply Loctite to any screws that are threaded into nuts or metal parts. Screws that tap into plastic do not need thread-locking compound.

- Fast!
- Rugged steel chassis.
- Did I mention it's fast?



- Doesn't handle well.
- Crude servo-saver.



YOU'LL NEED

- 2-channel radio.
- Throttle and steering servos.
- Fuel.
- Glow igniter.
- Receiver battery.
- Polycarbonate-compatible paint.



TEST GEAR

• Airtronics® CX2P transmitter and 94102 steering and throttle servos • Dynamite® Blue Thunder 20-percent nitro

PERFORMANCE

I packed up all my stuff and headed down to the local high school in search of a parking lot large enough to let the Xtreme run wide open—preferably, a lot without those seemingly magnetic parking blocks that attract fast-moving R/C cars. I found a freshly paved section without curbs (woo hoo!).

After a couple of yanks on the pull-starter, the engine roared to life, but I resisted the urge to go right for a speed run and tooled around at moderate speed for three tanks' worth of fuel to break the engine in properly. With the engine up to operating temperature and suitably loosened up, I leaned out the carb to the proper setting. Before I continue, I must say; take it easy on the throttle. I found out very quickly that the slightest yank of the gas sent the car looping around.

After a few minutes, I had more control over the skittish car, although the hard kit tires still allowed it to slide around more than I liked. When I was able to keep it going straight, I was impressed with its overall top-end speed. The carb hadn't even been leaned out, and it was already topping 35mph! I gave the needle a couple of tweaks before making a few passes through the *R/C Car Action* speed trap, and I managed a 39.97mph pass.

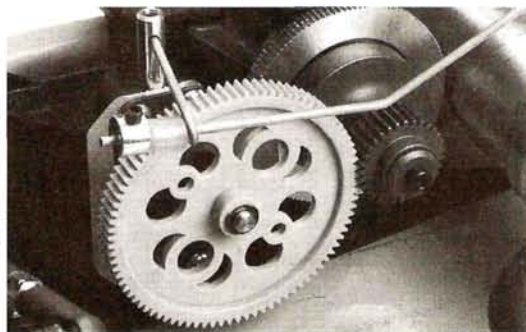
After only a few moments at this type of speed, I had to jump on the brakes to keep the car within radio range. The brakes didn't have much difficulty slowing it, but the tires' meager grip is soon overcome if you mash the brake too hard.

Having driven the truck version of the

Right: the rear suspension arm is mounted on two pivot blocks below the chassis. Stay away from curbs; these thin arms look fragile. Below: the front bumper also acts as a body-mount support. Just a reminder: the bumper is pretty flimsy.



Believe it or not, 48-pitch gears are used on this nitro rocket. During testing, they withstood multiple insane speed runs.



Nitro .21 Xtreme, I'm well aware of its 50mph potential. A near 40mph run with this version, although very fast for any R/C car, was kind of a yawner. The truck version has the benefit of larger tires to give it the edge in the top-speed department. The smaller, low-profile tires of this touring version just don't have the diameter to push the car much over 40mph. The engine has plenty of power to get it to higher speeds, but it just runs out of rpm.

I ordered a set of Schumacher's tallest gears for the Xtreme—a 34-tooth clutch bell and an 86-tooth spur gear. This is only one step up from the stock 31/89 gears, so I wasn't quite sure that it would push the car much faster.

I also fitted a set of Pro-Line® Road Rage tires designed for buggy wheels and for running on asphalt. Their softer compound not only provides better traction, but their larger

I used a set of Pro-Line Road Rage tires on the Xtreme. They not only grip better, but they also give the car a little more top-end speed.

diameter gives a little more top end. The larger tires require a little creative body trimming, but this is all about speed.

After some re-tweaking of the fuel mixture to ensure maximum speed, I again pointed the *R/C Car Action* super high-tech ATS radar gun and let it rip. It started with a 54mph pass, and in just four runs, it reached its peak of 56.4mph!—well beyond my expectations and the result of just a minor gear-ratio change and a new set of tires!

Keep in mind that even at 40mph, the Xtreme is a minor handful. When it starts to break the 50mph barrier, it resembles an 800-pound gorilla. Its chassis was originally designed for off-road use, so running past the ol' double nickels takes a steady, experienced hand.

Be sure to have lots of open space when you drive this one; you don't want to hit anything at the speeds it's capable of!

THE VERDICT

If you are looking for a speed demon, you have definitely found it. The Nitro 21 Xtreme doesn't handle very well because there is simply too much power for the little $\frac{1}{10}$ chassis, but that's what makes it fun (the power, not the bad handling). Look at it this way: a '69 Chevelle running nitrous and skinny drag tires up front doesn't handle very well either! The .21 Nitro Xtreme is all about burying the trigger in the radio handle and blasting the neighborhood speed record. If that sounds like fun to you, nothing will do it better—or faster—than the Xtreme.

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RADIO CONTROL

car action

TRUCK of the year

by Peter Vieira



"Oscar® forgets." That's what they say when a movie released early in the year is dubbed "Oscar®-worthy" yet is conspicuously overlooked at the time the awards are handed out.

Fortunately, that kind of shortsightedness was not a factor when the *Radio Control Car Action* editors sat down to hash out "Truck of the Year" possibilities, but you are forgiven if your first

thought when you saw these pages was "Oh, yeah, the NXT!" After all, the 1999 Truck of the Year was a quiet contender, even though it literally makes a lot of nitro noise. It debuted at the Chicago Hobby Show late in 1998,

but more fanfare was generated by the On-Road Worlds win of the truck's touring-car stablemate. Without a big factory push at the national competition level in

Team Losi NXT



1999, the truck earned little of the winners' circle limelight despite its status as a club racing favorite. Now the truck will get its just desserts as our 1999 Radio Control Car Action Truck of the Year. Let's hear it for the Team Losi NXT!

WHY IT WON

Obviously, Truck of the Year is not a mere popularity contest; it's truck of *the year*, not truck of *the moment*. Although some recent releases may have been more visible than the NXT, none delivered the goods like Team Losi's gas racer. A few primary features drew us to it: first, there's plenty of parts support. Just about every shop with a track has Losi parts on the wall, and since the NXT's suspension arms are shared with the original LXT electric truck and GTX nitro truck, your

local dealer is almost guaranteed to have arms for your NXT. Second, the NXT is cleverly designed for convenience and performance. The preset gear mesh makes setup simple, even for first-time gas builders; the center-mounted fuel tank maintains chassis balance as fuel is consumed; and a Lexan receiver cover keeps fuel and debris out of the electronics. The NXT is also very complete and includes a manifold and tuned pipe as well as top-quality Team Losi racing rubber. Finally, there's performance. The NXT maintains Losi's reputation for building well-sorted-out vehicles that adapt to just about any track with a minimum of setup fuss. Build the NXT according to the instructions, and you'll have a nitro truck that's ready for just about anything.

RADIO CONTROL car action **TRUCK** of the year

• **DUAL-DISK SLIPPER CLUTCH.** This design first appeared on the Kinwald Edition Double-X buggy, and it's put to good use on the Racer and Graphite Plus NXTs. For smooth clutch engagement and consistent slip action, this is the way to go.

• **WIDE-TRACK REAR SUSPENSION MOUNTS.** The rear suspension arms' inboard hinge pins are more widely spaced than they were on the GTX. The new layout helps the chassis resist roll induced by top-heavy nitro engines and gives the NXT a wider, more stable stance.

• **CENTER-MOUNTED FUEL TANK.** With the fuel cell in the center of the chassis, fuel consumption has no effect on its left/right balance. From start to finish, the NXT handles consistently. The vibration-damping, top-mounted screws are another nice touch.

• **INCLUDED PIPE AND HEADER.** The Graphite Plus NXT shown here includes Losi's new aluminum header; the Standard and Racer kits use a crush-proof silicone header. All NXTs feature the spun-aluminum tuned pipe shown here.

• **PRESET GEAR MESH.** You can forget about wrestling with torqued-down engine-mount screws; the NXT uses matched, specific clutch-bell and spur-gear ratios that can be bolted in without altering gear mesh.

• **NEW TRANSMISSION BRACE.** The old GTX brace limited engine selection; the new design allows just about any .12 engine to be used, with or without a pull-starter (Graphite Plus requires optional engine mounts and exhaust manifold to install a pull-start engine).

• **LEXAN RECEIVER COVER.** This sleek shield effectively protects the receiver from fuel spills and track crud. It's a small but welcome touch that shows Team Losi's attention to detail.

• **ANODIZED, COUNTERSUNK CHASSIS.** The NXT's barely-there chassis practically disappears beneath the components mounted on it, but it's one sturdy piece of aluminum. Kickup is built in, all screw holes are countersunk, and the full-length upper deck/brace makes the NXT a tough customer.

The countersunk chassis-plate screws eliminate screw heads that hang below the chassis and drag on the ground. Note the recess in the chassis for the fuel-tank pickup. This ensures that every drop of fuel is used, and the low-mounted tank keeps the CG as low as possible.

• **NEW LONG FRONT AXLES.** The NXT accepts Double-XT wheels. If you race electric and nitro trucks, that means fewer sets of tires in your pit box and more cash in your wallet.



Have it your way!

Team Losi offers the NXT in a few trim levels to suit racers of varying means. Whether you're one of those guys who shows up for a club race in a customized Winnebago workshop or the basic "everykid" who supports his R/C habit by mowing lawns and painting fences, there's an NXT for you.

BASIC KIT

Bearings/bushings Both
Axle-bearing spacers No
Engine type Bump- or pull-start
Slipper clutch Single disk
Rear hub toe 0°
Chassis Natural aluminum
Header Silicone
Pipe Tuned aluminum
Arms Stiffzell plastic
Chassis brace Stiffzell plastic
Drive axles Universal/dogbone
Shock shafts Stainless steel
Turnbuckles Heat-treated steel
Tires Losi Step-Pin
Wheel nuts Steel
List price \$314

RACER KIT

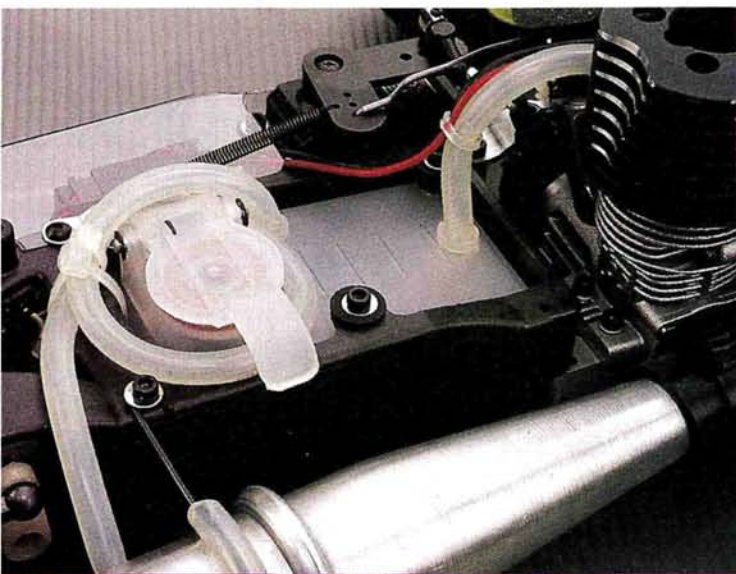
Bearings Yes
Axle-bearing spacers Yes
Engine type Bump- or pull-start
Slipper clutch Double disk
Rear hub toe 1°
Chassis Black anodized
Header Silicone
Pipe Tuned aluminum
Arms Stiffzell plastic
Chassis brace Stiffzell plastic
Drive axles Universal/dogbone
Shock shafts Stainless steel
Turnbuckles Heat-treated steel
Tires Losi Step-Pin
Wheel nuts Steel
List price \$439

GRAPHITE PLUS

Bearings Yes
Axle-bearing spacers Yes
Engine type Bump-start only
Slipper clutch Double disk
Rear hub toe 1°
Chassis Black anodized
Header Aluminum
Pipe Tuned aluminum
Arms Graphite composite
Chassis brace Graphite composite
Drive axles MIP CVD
Shock shafts Titanium nitride
Turnbuckles Titanium
Tires Losi Reptile
Wheel nuts Aluminum
List price \$499



Above: the TOP CT12 engine provides world-class horsepower for our "Truck of the Year" NXT, though installing this particular engine requires some finesse and patience.



Above: the center-mounted fuel tank maintains balance as fuel is consumed. The thumb lever on the fuel tank's filler cap allows fast refueling.

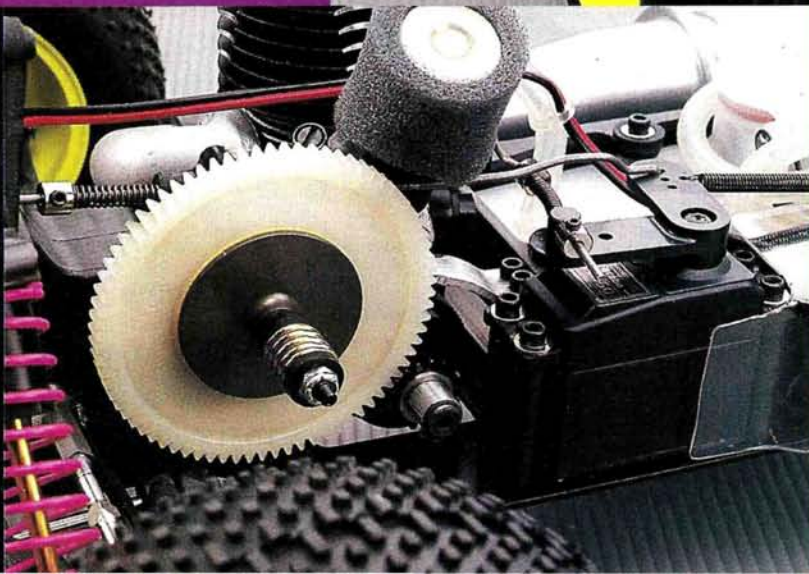


Right: a Lexan cover protects the receiver from being blasted with dirt. Note the throttle return spring—a requirement for all NORRCA-sanctioned gas races.

THE RULES

The rules we used to determine which trucks qualified for consideration as the 1999 R/C Car Action Truck of the Year are simple:

1. Only vehicles sold through normal distribution channels in the United States and available on dealer shelves or by mail order before June 30, 1999, were considered. Kits available after that date will be eligible to be chosen as our "2000 Truck of the Year."
2. All R/C vehicles that are available with a "truck" body (scale pickup, stadium truck, tractor trailer, or van) are eligible for consideration, regardless of scale, class, or type of power (nitro or electric).



Left: the NXT features a strong double-disk slipper for the rigors of gas racing. The engine is mounted on fixed mounts to keep the clutch bell and spur gears perfectly aligned. A ratio change requires the replacement of both gears. ■

1999 IFMAR

George M. Gonzalez

Baseball fans have the World Series; wrestling buffs have Wrestlemania; motocross fans have the Trophy des Nations; we R/C guys have the IFMAR Worlds.

The IFMAR 1/10-Scale Electric Off-Road World Championships is arguably the most highly anticipated event in R/C model car racing. Victory earns the winning chassis, motor, battery, ESC and tire manufacturers valuable bragging rights that often lead to increased sales. In keeping with the "Race it on Sunday, and sell it on Monday" philosophy, a win at the IFMAR Worlds is extremely important to the manufacturers because most average R/C racers like to be associated with the winning team.

The '99 Worlds was held in the small, beautiful maritime community of Rauma, Finland, on the Gulf of Bothnia off the Baltic Sea, approximately 200 miles northwest of Helsinki, the country's capital. The Rauma Auto Sport Club comprises nearly 300 members and has been in operation for more than 35 years. It graciously hosted the event with help from the Helsinki Model Racing Club. Nearly 300 racers from 19 countries attended, which made the IFMAR Worlds the most international event of any kind ever to be held in Finland.

Team Losi, Team Associated, Yokomo, Schumacher, Kyosho and Tenth Technology all fielded racing teams hoping to make IFMAR history, and several motor, battery and ESC manufacturers were also looking for big wins to catapult their marketing campaigns. The racers, mechanics, IFMAR officials and the hundreds of spectators who filled the bleachers every single day for the most part enjoyed beautiful sunny weather in the low to mid-70s.

I travel extensively covering racing events for *R/C Car Action* magazine, and I felt fortunate to be in Finland for this

R/C racing spectacle—one of the most exciting I ever encountered—an

awesome venue! I hope you enjoy reading about it as much as I enjoyed being part of this historic event. Turn the page and take a trip to Finland. No passports required for this journey!

OFF.

TEAM LOSI wins the 4WD Fight ...



Above: the 4WD A-main finalists on the giant two-story drivers' stand just before the start of the first leg.





The fastest cars were grouped in heats during qualifying. IFMAR starts were used to keep mishaps to a minimum.

The facility and the track

A giant indoor soccer hall housed the IFMAR Worlds. Tons of gravel and clay were brought in to make the off-road track, and the organizers built a giant two-story drivers' stand and set up pit tables to comfortably accommodate more than 150 drivers. Three timing computers provided electronic lap counting, and two AMB transponder systems were used simultaneously to provide back-up and ensure glitch-free operation.

The enormous —150x50-foot— track had a long straightaway that fed into a sweeper that guaranteed high-speed action. The fastest average lap time was 26.26 seconds, which should give you an idea of the track's massive size. Its layout was technical, but the unusually wide lanes and sheer size made the course look easy. But it was far from easy because of one obstacle: the triple jump/rhythm section. At a glance, the triple jump looked like a cakewalk, but clearing it in one jump required precision driving and nerves of steel because if you didn't land correctly off the jump, the rhythm section that immediately followed took its toll on the vehicle's suspension. Many cars broke as a result of poor timing, and the triple jump changed the running order on just about every lap, leading to extremely exciting heat races.

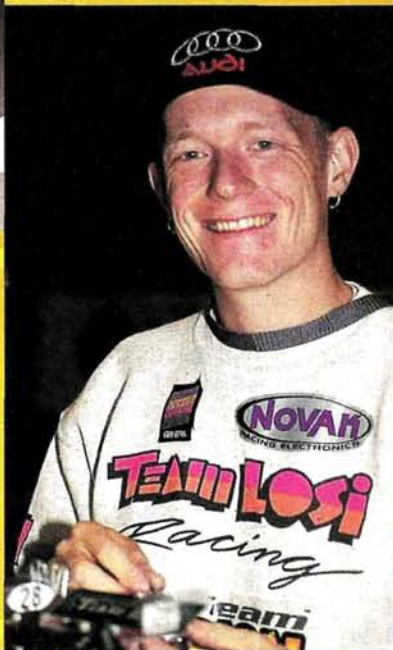
For 2WD competition, the track was changed slightly: the approach to the dreaded triple jump was decreased. This forced drivers to tackle the obstacle in two jumps instead of one. The hard-packed dirt and clay track was equally challenging because of the loose dirt and sawdust that covered it. When the drivers found the right tires and proper chassis setups, however, they laid down the ponies without any problems. The track was swept after every round and lightly watered after each day of competition. It remained consistent throughout, even though some of the fastest times were recorded in the later rounds.

ROAD

ASSOCIATED takes the 2WD Trophy



PHOTOS BY GEORGE M. GONZALEZ



Above: the 2WD trophy presentation, or champagne war. Masami got drenched. Left: a happy 4WD world champion—Jukka Steenari.

WORLDS

TRACTION TALK

World championships are always the breeding ground for many new specialized R/C parts, and tires in particular are a hot topic. New tire treads and compounds are usually the most controversial issue; because their availability is limited, they're mostly reserved for members of a particular team.

This event was no exception; both Team Losi and Pro-Line introduced new treads. Team Losi's Taper Pins have won championships and dominated racing events, and they were also the most popular tires in the 4WD. All Team Losi drivers used these tires molded in Team Losi's new Yellow compound, and they helped Jukka Steenari capture the 4WD World Championship. Steenari and other Team Losi drivers also used Trinity's Da-Bomb two-stage inserts, which many believed offered an advantage.

During the fourth round of 4WD qualifying, Brian Kinwald brought out his secret weapon: special rear tires he had fabricated in an effort to gain the competitive edge. These Team Losi "Inside-Out" tires are mounted to the wheel inside-out, hence the name (check out the photo of Kinwald's creation). Notice that the center portion of the prototype tire features Losi's Taper Pin tread pattern, but the outer edges are separate pieces of tires that have been glued inside out and mounted to the wheel. Kinwald also used Trinity Da-Bomb two-stage foam tire inserts for extra support. The tires took several hours to fabricate, but we may see a variation on this tire concept coming soon from Team Losi. Unfortunately, Kinwald's lap times were a tad slower when he used the prototype tires, so he switched back to the Yellow-compound Taper Pins.

The Pro-Line team drivers also experimented with new tires. Pro-Line's new code name "Slash" 2WD and 4WD rear tires have a tread pattern that's similar to the company's successful Hole Shots, but they feature closer, more intricate micro-paddles and the same, flat-profile carcass as is on Pro-Line's Super Square Fuzzies. These new tires worked very well, but Masami Hirotsuka won the 2WD World Championships using Hole Shots, while Mark Pavidis set the TQ with Square Fuzzies (both drivers chose Pro-Line's M3 compound and used the stock molded inserts).

Pro-Line also introduced its new Blade front buggy tire. It has two tread patterns and is similar in design to the Blade front truck tires. The inside half has two standard ribs, and the outside half has a tread pattern similar to the Hole Shots'. These tires looked cool, but they didn't work very well

on the Worlds' track. Pro-Line also introduced its new, wide, 4-rib tires made specifically for the new-generation wide front buggy wheels. These and Pro-Line's new Radius Rib front tires were the hot ticket used by all the Pro-Line drivers. Both Pavidis and Masami chose the Radius Rib front tires with great success.

Although Pro-Line's new "Slash" rear tires didn't fare so well at the Worlds track, back in the States, they just might be the best thing since the company's Square Fuzzies. We'll just have to wait and see.



Kinwald unleashed his secret Inside-Out tires during one of the last rounds of 4WD qualifying to try and shave a few 1/10 second off his best time. The tires were actually 1/4 second slower, so he tossed them back into his box o' tires.



Pro-Line introduced three new front-tire options for 2WD buggies at the Worlds. The 4-Row (left) and Radius Rib (right) worked out best. The Blade tires (center) are designed for blue-groove tracks, which the Worlds track was not.



TIGHT RACING SCHEDULE

This year's World Championships lasted only eight days. It ran on a condensed, tight schedule with two individual racing classes. The previous Off-Road Worlds held in the U.S. were spread over two weeks. The 2WD and 4WD classes each took three days, and one day was allocated for each class registration. The condensed schedule met with the approval of most racers, manufacturers and organizers because competing was much more affordable, and everyone went home a little sooner.

The tight schedule gave the contestants very few opportunities to dial in their cars, and practice time was precisely scheduled. Drivers were given 10 practice heats in each class, and up to 15 cars were on the track at the same time. During the final round of practice, the racers' cars were equipped with lap-counting transponders. Cars were staggered on different locations on the track during practice heats to avoid pileups and other mishaps.

The drivers' times during the controlled practice heats determined the starting order for qualifying. This new prequalifying system ensured placement according to skill level, which immediately separated the men from the boys, so to speak, and the fastest drivers were grouped where they belonged. The qualifying heats were almost as exciting as the finals—much to the delight of the spectators.

During five rounds of qualifying, racers earned points based on their individual lap times and final heat times relative to the times of all the other drivers in their class, not just in their heat. The fastest time earned 155 points, the second fastest 153, the third fastest scored 152 points, the fourth fastest 151 and so on down to zero points if all 150 slots in each class were booked to maximum capacity. The racers then discarded their two lowest scores; however, many of these throw-out rounds settled ties at the end of the qualifiers. I might also mention that the qualifiers and subsequent finals all lasted 5 minutes and were not the usual 4-minute heats that we're accustomed to in the U.S., and this made gearing, motor and tire selection critical.

The top 10 fastest drivers in 2WD and 4WD qualified for the Grand Final in which they faced three legs of racing (triple A-mains). The winners in all of the lower Mains, however, were decided in a single Main. Drivers in the A-main Grand Final scored points according to their finishing position in each of the three legs (first place = 10 points, second place = 9 points, third place = 8 points, etc.); the lowest scores were thrown out, unless used to settle ties.

The IFMAR qualifying and Main event scoring system is very intricate and a bit confusing, but it is one of the fairest in model car racing. Many variations of it are used today by the various R/C sanctioning organizations throughout the world. This was the first world championship I attended that used this new prequalifying system, where lap times and heat times were used to sort the drivers into heats instead of having the computer system select the heats at random.

4WD QUALIFYING

Round 1. Team Yokomo factory driver and reigning 4WD world champion Masami Hirotsuka (Japan) set the TQ pace after posting an 11/5:0.52 and winning the last heat. Hirotsuka got off to a good start, but he ran into trouble and did not qualify for the A-main Grand Final. Masami had trouble with the triple jump and rhythm section of the track, as did most of the other drivers.

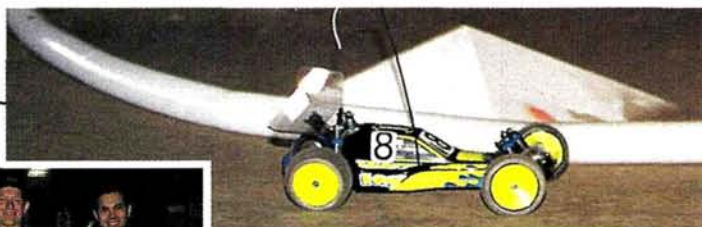
Team Orion/Team Losi driver Jukka Steenari (Finland), who raced in the same heat at Hirotsuka, was about 1/2 second slower and qualified in second. Team Trinity/Team Losi factory driver Brian Kinwald (USA) was a couple of seconds behind Steenari and rounded out third. As a footnote, Kinwald logged in the fastest single lap time (26.62 seconds), but Hirotsuka had the fastest average lap time (27.32 seconds).

Round 2. Team Orion/Team Schumacher driver Teemu Leino (Finland) was the first to break the 11-lap barrier by posting a 12/5:27.04 and winning heat 13. Steenari won heat 14, however, and posted a 12/5:22.32 heat time—the man to beat! Team Associated/Reedy/Yokomo factory driver Mark Pavidis (USA), who raced in the same heat as Steenari and finished second, rounded out third. At this point, Finland had a one-two punch. Steenari also bettered Kinwald's best single lap time with a superfast 26.26-second lap—the fastest single lap time in 4WD.

Round 3. Kinwald joined the 12-lap club and took over the TQ by posting 12/5:23.70 and winning his heat. Steenari improved his time by nearly 3 seconds—1 second shy of Kinwald's time—and that placed him second. Team Orion/Team Losi driver Jimmy Jacobson (USA) stepped up to third, while Pavidis slipped back to fifth



The successful gang from Team Orion had several drivers in both A-main Grand Finals.



behind Team Trinity/Team Losi driver Matt Francis (USA).

Round 4. Steenari once again claimed the TQ and never gave it up. Pavidis was back in second after a 12-lap run. Francis moved up to third, Finnish driver Teppo Kauppinen of Team Orion and Team Losi slipped into fourth.

Round 5. Steenari was designated TQ and given the prime spot on the A-main grid. Kinwald came back strong and secured the spot next to the pole, while Pavidis settled for third. Leino, Team Trinity/Team Losi driver Scott Brown (USA), Team Trinity/Team Losi driver Mark Francis (USA), Kauppinen, Team GM/Team Losi driver Brian Dunbar (USA), Jacobson and Team Trinity/Team Losi driver Matt Francis (USA) qualified fourth through 10th respectively. Eight Team Losi Double X4s, one Yokomo MX-4 and one Schumacher Cat 2000 made up the A-main.

4WD A-MAIN

First Leg. Jukka Steenari led the pack around the first lap with Mark Pavidis and Brian Kinwald in tow. Steenari and Pavidis cleared the

RAUMA: CITY OF CULTURE

The settlement of Rauma dates back to medieval times. The heritage is present in the traditional food, in the elaborate handicrafts and in the local music. Large annual events also have a distinctly local touch: Rauma Lace Week (Rauma is world-renowned for its high-quality lace products), Festivo, Rauma Blues, Euravisio, Kustaan soitto (traditional musical event), Huovinretki hiking, etc.

Rauma's nature revolves around the Baltic Sea, Lake Pyhäjärvi and—joining the two—River Eurajoki. Water has always been important to the district because it fuels many industries, allows safe passage and unites cultures.

In 1991, the United Nations Educational Scientific and Cultural Organization (UNESCO) selected Old Rauma, which

dates back to the early 1400s, as a world heritage site—a place with a valuable cultural history—based on the fact that it is the most representative, extensive, uniform and living example of the traditional wooden towns of the Middle Ages in the Nordic countries.

Rauma harbor is the largest of its kind on the west coast and—because of innovative modern techniques—also the most efficient harbor in Finland; more than 4 million tons of goods—exports and imports—pass through every year. Finland's largest exports by far are paper and paper products.

Rauma is a fascinating district filled with culture, beautiful nature and friendly people. I only hope that others attending the IFMAR Worlds had the opportunity to explore the town as I did. I will never forget my visit to Rauma; in fact, I was so inspired that I plan to return.

1999 IFMAR OFF-ROAD WORLDS

THE WORLD CHAMPS SPEAK OUT

I interviewed each newly crowned world champion immediately after his winning heat to capture his thoughts during this highly emotional moment. I asked each driver the same questions at different times. Here's what they had to say:

RCCA: Congratulations on winning the World Championship. So tell me, what's going through your mind right now?



Jukka Steenari: Nothing ... absolutely nothing; my mind is completely blank. I can't believe I did it! When I started racing 14 years ago, I would never have guessed that I would some day win a world championship. It's simply amazing!



Masami Hirosaka: I'm very cold! (Masami was drenched in champagne). Aside from that, I'm also excited and very proud of our team.

RCCA: What are your opinions of the track, the facility and the organization of the event?

JS: Everything has been run extremely smoothly. And the track, although relatively flat and wide open, is extremely challenging.

MH: The track, facility and organization were all perfect; I can't find any flaws.

RCCA: In your opinion, what was the most difficult aspect of preparing for this event—both mentally and physically?

JS: Trying to find a track to practice on because tracks are very limited around here. I did most of the practicing in an indoor parking hall with a really slick concrete surface.

MH: I prepared for this race like I prepare for all the other races I attend. It was no different to me, and preparing for this event didn't pose any particular problems.

RCCA: How long until you were comfortable with your car's setup?

JS: It only took me about two packs to get dialed because I pretty much know my way around the Double X4 chassis, and I already had my car set up for aggressive steering. Most of the adjustments were to tune down the steering a bit, and then my car felt dialed.

MH: The more tracks I run on, the better I get. My car felt good from the start; I just needed to learn the track.

RCCA: What part of the track did you find to be the most difficult?

JS: Obviously the triple section.

MH: The triple jump. I didn't like that section of the track very much.

RCCA: In your opinion, who was your toughest competitor?

JS: Definitely Brian. He was really fast and consistent all the way.

MH: Mark Pavidis. Because Pavidis was a teammate, that gave me a safe feeling. It didn't matter if I won or Mark because either way, it would have been a win for the team.

RCCA: So how do you plan to celebrate your victory?

JS: I haven't really planned that yet, but I'll figure out something when I get back home.

MH: I'm going to eat a lot of good food.

RCCA: Any words of wisdom you can pass along to our readers, some of whom might be future world champions?

JS: Keep trying! When you start something, you never know how things will end up. It takes a lot of effort, but what doesn't these days? If you have talent, just go for it!

MH: Keep racing and never lose hope. The more you drive, the better you get. It has worked for me.

RCCA: Jukka, what happened on that last lap in the second leg of the finals? It seemed as though everyone crashed at the same time going through the triples. After you recovered from the crash, it looked as if your car had a glitch. What actually happened?

JS: Well, it's kind of embarrassing, but for a moment, I lost track of my car and thought I was driving Brian's car. I suddenly realized my mistake when I saw my car all sideways on the straightaway.

RCCA: Masami, how many world championship victories do you have now? Where do you plan to display the trophy?

MH: This makes 10. I plan to display the trophy at the Yokomo facility in Japan; after all, this is my country's world championship.

RCCA: Thanks for your time, and congratulations on your wonderful achievements.

dreaded triple section without problems, but Kinwald rolled his buggy after a rough landing; this allowed Teemu Leino to sneak into third. After lap 2, the cars spread out around the track, and it looked as if the positions would remain fixed, but the triple section decided the success—or fate—of each driver.

During lap 3, Pavidis closed the gap slightly between his Yokomo MX-4 and Steenari's Double X4, and Kinwald was all over Leino until he got stuck in a pipe and snapped one of his car's drive belts. Kinwald was out for the count, but the race was still on. Steenari continued to lead, with Pavidis on his tail and Leino third. Near the halfway mark, Leino rolled his car and swapped positions with Teppo Kauppinen (in fourth), and Steenari kept Pavidis in check. Although Pavidis pursued Steenari with great tenacity, Steenari held him off for the rest of the race and finished first. Pavidis slid in a few seconds later to claim second, and Kauppinen held third.



Richard Saxton (left) and Mark Pavidis look over the qualifying times to see where Pavidis stands. The order changed on every single round of qualifying.

Second leg. During the formal 10-second countdown before the start, the auditorium was dead silent; you could have heard a pin drop and could almost feel the tension in the air. At the starting tone, Steenari launched off the grid with an authority that confirmed his intentions to win the event with back-to-back A-main victories. Unfortunately, his car got squirrely after the triple jump, and Pavidis stormed by to claim the lead. To add insult to injury, Kinwald also got around Steenari to claim second.

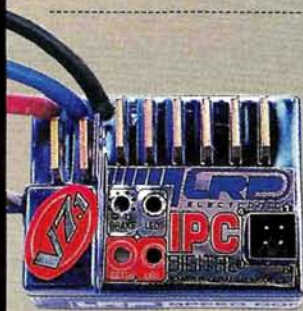
In lap 5, the triple section wreaked havoc on the running order, as Pavidis, Kinwald and Steenari all rolled their cars at the conclusion of the obstacle; now the leaders were all on their lids! When the cars had been marshaled and were off again, Kinwald had the lead with Steenari in second. Jimmy Jacobson came from

1999 IFMAR OFF-ROAD WORLDS

GM

GM VIS 3000mAh cells. GM* introduced its new 3000mAh NiMH cells at the Worlds, but they were not legal for competition (yet). GM offers sport and race versions, but all of the cells undergo GM's voltage-increasing system (VIS) to ensure maximum punch. The racing packs come from the absolute best cells and are matched on a state-of-the-art battery cycling and matching system.

V12 Worlds ESC. GM updated its top-of-the-line V12, and it now includes new software and more powerful and efficient FETS. The ESC is completely programmable and needs no optional equipment to adjust its many drive parameters. Masami Hirotsuka won the 2WD with the V12.



LRP

IPC Digital V 7.1

ESC. The latest version of the popular IPC ESC features updated software and new, more power-

ful and efficient FETS that increase run time and motor power, while providing more consistent brakes. The ESC comes with several preprogrammed torque-limiting chips and four profiles. It should be available when you read this, and the company's long-awaited Phaser Interference Suppression FM receiver should also be available in 27 and 75MHz operating bands.

REEDY

Reedy Cyberpack. All the Reedy* drivers competed with the company's best matched 2000 cells, but Reedy also displayed a new sport pack for the backyard crowd. It features Panasonic's new bulletproof 1400mAh SCR cells that provide plenty of punch and run time, yet they are among the most resilient batteries available. They also make great practice packs for stock-class racers.



KYOSHO

New 2WD buggy. Kyosho* surprised everyone when it unveiled a new 2WD racing buggy. Unfortunately, taking pictures of the new chassis was forbidden by the manufacturer, so for now, this body-on shot has to suffice. That doesn't stop me from telling you about it, though!



The car has a molded, heavily braced chassis, and the battery is mounted low on a recessed channel that allows the cells to be moved forward or backward to adjust weight distribution. A separate front bulkhead provides the kick-up and is used to mount the front suspension. The steering servo is mounted flat on the chassis close to the chassis centerline. A conventional twin-bell-crank steering system provides the correct steering geometry. The slipper-clutch-equipped transmission

looks to be of the 3-gear variety, but it's heavily braced on both sides with molded side plates and aluminum posts. The car's long-travel front and rear shocks are mounted to graphite shock towers, and extra-long suspension arms are all around. The prototype also has universal swing shafts and inline front axles. The body is a real showstopper, and it definitely illustrates the car's racing intentions. More on Kyosho's new buggy soon.



Blue Factor accessories. LRP X-tra Cleaner is perfect for cleaning motors and removing dirt and grime from bearings. The spray is safe for plastics and other chemically sensitive materials, so it can be used for general cleaning. I'm told that it's great for cleaning nitro-powered vehicles as well. LRP* also introduced a new CA called Zip Plus CA (not shown) that's specially formulated for the needs of the R/C racer, and a CA glue accelerator called Turbo Activator (the first to come in an aerosol can). It also has a special anti-fogging agent, so it dries clear.

nowhere to claim third, and Pavidis got stuck in fourth. Moments later, Steenari's car rolled over in the chicane section, so Jacobson took second.

Four minutes down, Kinwald once again rolled his car going through the triples—just long enough for Jacobson take the lead, and Steenari claimed second. It was now Jacobson, Steenari and Kinwald, in that order. The track computer clicked down the final seconds as the drivers entered the final lap. Jacobson only had to keep Steenari in check for a few more seconds; instead, he rolled his car after a rough landing coming off the triples, and that let Steenari regain the lead momentarily until his car got completely sideways on the straightaway. Again, Jacobson was in front. Steenari grabbed a handful of throttle and literally shot past Jacobson, regained the lead at the wire and ... Jukka Steenari is the new IFMAR 1/10-Scale Electric 4WD World Champion! Jacobson placed second and Scott Brown surprisingly took third,

but only Jukka's place on the podium was secure; the third leg of the triple A-mains would decide who the overall second- and third-place winners would be.

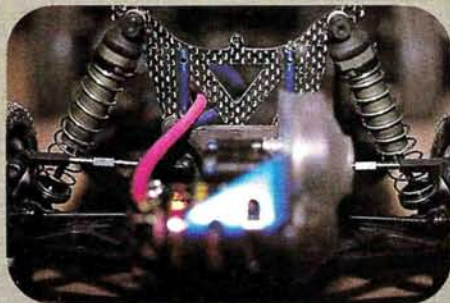
Third leg. In honor of his achievement, Jukka Steenari's car was placed on the grid (pole position, of course) as he



Gil Losi Jr. and Brian Kinwald discuss driving strategies.

TEAM ASSOCIATED

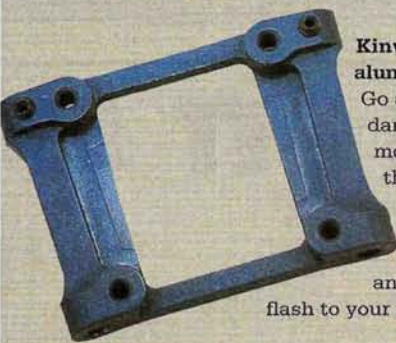
B3 rear shock tower. Many Team Associated* drivers raced with new prototype graphite shock towers on their B3s that changed the rear suspension geometry slightly.



According to Cliff Lett, the B3's rear shock tower was one of the few items left from the B2 era, and the new shock tower is designed to give the B3 the correct geometry the designer envisioned. The prototype shown here has wing-mounting screws attached to the rear shock tower with tiny machine screws; the production unit may be different.

TRINITY

Kinwald Triple X blue-anodized aluminum motor plate. It's lighter than the stock piece and finned for greater heat dissipation, and, best of all, it's blue! The perfect accessory for your new Triple X.



Kinwald Triple X blue-anodized aluminum suspension-arm mount. Go ahead and case that triple; I dare you! This alloy suspension mount handles all the abuse you throw at it, and it features grub screws that capture the hinge pins—eliminating the need for E-clips. And yes, it's blue-anodized to add flash to your ride.

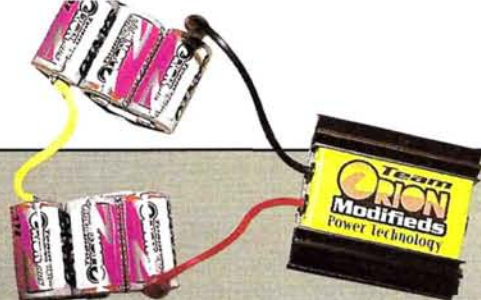
Trinity motor lathe. Exclusively manufactured for Trinity*, it should be available soon and will include a bunch of accessories and a handy carrying case. Trinity motor specialists Jim Dieter and David Spashett love the new com lathe.



TEAM ORION

20-amp discharger.

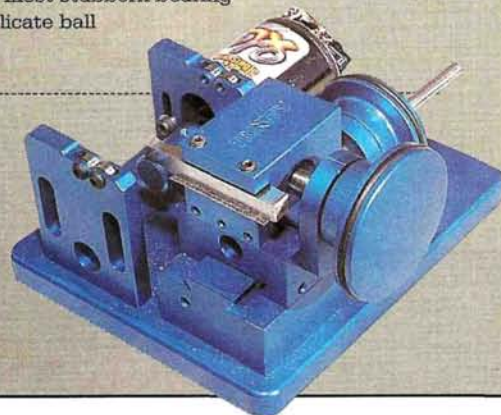
This compact and handy discharger is self-powered and discharges your battery packs quickly because of its constant 20A load. Once your pack reaches a safe discharge voltage, the unit switches off to prevent damage from over-discharging. The unit comes with alligator clips that have long leads for quick and easy installation to your battery pack. In addition, it features an LED to indicate the discharge status.



Top machine- and hand-wound motors. Team Orion's* new Top motor technology is now available. These new motors feature an all-new end-bell with built-in capacitors and a new motor can and magnets that provide a greater magnetic field. Available machine- and hand-wound, they both feature high-quality ball bearings, pattern-wound armatures and epoxy balancing. The hand-wound motors have a new chrome can, and several new winds are available, including a 9-turn double used by Jukka Steenari to capture the 4WD World Championship.

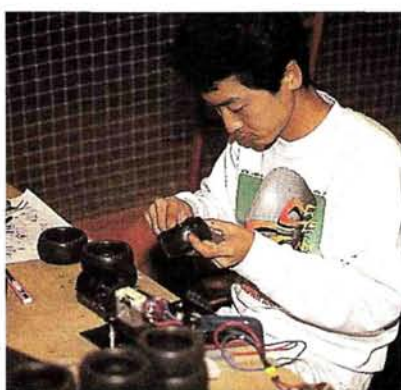


Bearing removal tool. If you're a serious motor builder and own a comm lathe and a dyno, you'll want this tool. Team Orion's new bearing pulling tool is designed to quickly remove bearings or bushings from electric motors. As you know, motor bearings have a funny way of becoming permanently attached to the motor can, but this tool will remove even the most stubborn bearing without damaging the delicate ball races inside the bearing.



walked to the drivers' stand to take a bow. But Steenari opted to remove his car from the starting grid and let the rest of the racers sort out the claim for second and third, leaving Kinwald in a prime location to get the holeshot.

Kinwald and Pavidis shot out in front and entered the sweeper at the same time, but they chose the same line and got tangled, which gave



Masami Hirose quietly builds tires for himself and his team.

Jacobson the honor of leading the racers around the huge circuit. In the triples, Leino got around Jacobson for the lead, with Kinwald and Pavidis closely behind. They ran in that order for several laps, but the unforgiving triples once again changed the running order when Kinwald flipped his buggy and fell back to fourth. Now Pavidis was in second, and Jacobson was all over his back door. Meanwhile, Leino continued to stretch his lead.

Pavidis and Jacobson battled for second, while Kinwald rode it out in fourth waiting for opportunity to knock. That opportunity came sooner than expected. On the very next lap, Pavidis and Jacobson locked horns, and Kinwald squeaked by to claim second, Jacobson third and Pavidis fourth. The scores confirmed Steenari as the champion. Jacobson and Kinwald tied for second, but when their throw-out rounds had been factored in, Jacobson finished second and Kinwald third.

1999 IFMAR OFF-ROAD WORLDS

2WD QUALIFYING

Round 1. Thirty-four of the world's fastest drivers—and most well-known R/C celebrities—put in blazing-fast, 12-lap runs and finished within seconds of one another! Mark Pavidis' first-place finish in heat 14 and his 12/5:12.86 final heat time set the TQ pace. Teemu Leino, racing in the same heat as Pavidis, finished second with 12/5:14.18, and Peak Performance/Team Losi driver Rick Hohwart (also in the same heat) was third. Masami Hirosaka's 25.33-second single lap time was the fastest in round 1, but Pavidis registered the fastest average lap time (26.07-seconds).

Round 2. Hirosaka moved up to the TQ spot with a near win (12/5:11.91); Team Associated/Reedy/Pro-Line driver Scott Hughes was second (12/5:13.67). Reigning 2WD world champion Brian Kinwald posted 12/5:13.95 for third. No one beat Hirosaka's single lap record or Pavidis' 26.07 average lap time in this round.

Round 3. An exciting but very disappointing round for many. Kinwald was now on the pole; he won his heat (12/5:15.38). Independent Finnish driver Jouko Termonen surprised everyone when his name appeared right below Kinwald's in the qualifying order. Team Associated/Reedy/Pro-Line driver Jason Ruona managed



IFMAR'S BIG BULLY

I actually missed Masami taking back the lead from Rick Hohwart in the first 2WD A-main because a hell-bent track employee picked me up and tossed me aside with a terse "You can't stand there!" What an ... oops, I almost forgot, this is a family-oriented publication. The same MORON actually threatened to throw Team Losi owners "Pops" Losi and

Ernie Provetti out of the race because they were comfortably sitting off to the side of the track on seats supposedly reserved for track officials. That wasn't all; this jughead then forbade the photographers from taking pictures during the 2WD trophy presentation! You know what the toughest four years of this guy's life were? Fourth grade.

THE ULTIMATE PIT SP



When you pull up the Team Serpent Network web site you pull into gas racing's ultimate pit space. Browse the on-line version of our 80-page, 200-photo Tech Book—a virtual gas car bible that puts 20 years of tuning know-how at your fingertips. Join the Cyber-Pit, a unique interactive web page where racers from around the world share tech information. Download our exclusive START datalogging software...for free. Or read the latest tuning tips in columns by the current World T.Q., the ROAR Champion, and other experts. TSN—get it dialed up, and get your car dialed in.



third (12/5:16.44). Pavidis posted 25.29 for a new track record, and he also set a new average lap time record (26.45 seconds), but he dropped to sixth in the qualifying order.

Round 4. Coming out of this round, Pavidis was ahead on points and in the TQ spot. Pavidis put in a smoking 12/5:11.71—the fastest time of the day. He also improved his average lap time (25.98 seconds) but did not set a new single lap record. Kinwald slipped to second; Hirosaka climbed to third. No one wagered a bet on the fifth and final round.

Round 5. Pavidis won his heat and officially secured the TQ (12/5:11.38). He established a new heat time record: no one was faster during the Mains. Kinwald won his heat (12/5:16.11), which locked him into second. Hirosaka, racing in the same heat as Kinwald, finished third and ended up qualifying in third. Ruona, Hohwart, Team Associated/Reedy/Pro-Line driver Billy Easton (USA), Team Associated/Reedy/Pro-Line driver Lloyd Dassonville (USA), Leino, Steenari and Termonen qualified fourth through 10th in the A-main Grand Final.

2WD A-MAIN

First leg. Controversy was inevitable: I've never attended a world championship where some issue wasn't debated between a team captain and an IFMAR official. In this case, the conflict revolved around the placement on the grid of the TQ car, specifically whether it would be placed on the inside or the outside lane. During the 4WD competitions, the pole-sitter basically chose his



Above: Pro-Line's Tim Clark (left) and Jason Ruona talk traction. **Left:** Peak Performance company owner Rick Hohwart glues up a set of tires for the next heat. Rick was the oldest A-main finalist in 2WD.

grid position (naturally, the most advantageous spot); during the 2WD competitions, however, Pavidis was denied that option and had to start from a position that, according to Mike Reedy, offered no advantage to his TQ designation. Pavidis' car was placed on the center of the lane a few car lengths ahead of the second qualifier, which, in my opinion, gave him an excellent line into the first corner. It was conceivable, however, that the second- or even third-place car could get the holeshot and control the choice line if it could get enough traction at the start.

And traction was the issue: Pavidis' car momentarily spun its rear tires at the start, and Kinwald's car literally plowed into the rear of Pavidis' car and flipped over on its lid. Pavidis' car was brushed out of the way by oncoming traffic, and it was Hirosaka in the lead, followed by Hohwart and Steenari. Pavidis struggled his way into fourth, while Kinwald was sixth behind Ruona. On the second lap,

CE IS IN CYBERSPACE



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Serpent
EXCITEMENT IN THE FAST LANE

1999 IFMAR OFF-ROAD WORLDS

WINNERS

4WD MODIFIED

Fin.	Qual.	Driver	Chassis	ESC	Motor	Battery	Radio	Tires (F/R)	Gearing
1	1	Jukka Steenari	Team Losi XX4	Novak Cyclone	Team Orion 9x2	Team Orion	Airtronics M8	Losi Taper Pin	17/86
2	9	Jimmy Jacobson	Team Losi XX4	Novak Cyclone	Team Orion 9x2	Team Orion	Airtronics M8	Losi Taper Pin	17/86
3	2	Brian Kinwald	Team Losi XX4	Novak Cyclone	Trinity D3.5 10x2	Trinity	Airtronics M8	Losi Taper Pin	19/86
4	4	Teemu Leino	Schumacher Cat 2000	LRP IPC V7.1	Team Orion 9x2	Team Orion	Airtronics M8	Pro-Line Hole Shot	5/89
5	7	Teppo Kauppinen	Team Losi XX4	Novak Cyclone	Team Orion 9x2	Team Orion	Airtronics 3PS	Losi Taper Pin	17/84
6	6	Mark Francis	Team Losi XX4	Novak Cyclone	Trinity D3.5 10x2	Trinity	Airtronics 3PS	Losi Taper Pin	19/84
7	3	Mark Pavidis	Yokomo MX-4	LRP IPC V7.1	Reedy Tri-Sonic 10x4	Reedy	Airtronics M8	Pro-Line Hole Shot	18/84
8	5	Scott Brown	Team Losi XX4	Novak Cyclone	Trinity D3.5 10x2	Trinity	JR R1	Losi Taper Pin	18/84
9	8	Brian Dunbar	Team Losi XX4	GM V12	GM EVO 3 10x3	GM VIS	Airtronics M8	Losi Taper Pin	18/84
10	10	Matt Francis	Team Losi XX4	LRP IPC V7.1	Trinity D3.5 10x2	Trinity	Airtronics M8	Losi Taper Pin	20/86

2WD MODIFIED

1	3	Masami Hirosaka	Associated B3	GM V12	Reedy Sonic II 9x2	Yokomo	KO	Pro-Line Radius/Hole Shot	18/81
2	1	Mark Pavidis	Associated B3	LRP IPC V7.1	Reedy Sonic II 10x3	Reedy	Airtronics M8	Pro-Line Radius/Hole Shot	18/81
3	2	Brian Kinwald	Team Losi XXX	Novak Cyclone	Trinity D3.5 11x2	Trinity	Airtronics M8	NA	20/78
4	6	Billy Easton	Associated B3	LRP IPC V7.1	Reedy Tri-Sonic 10x3	Reedy	Airtronics M8	Pro-Line Radius/Square Fuzzie	19/81
5	9	Jukka Steenari	Team Losi XXX	Novak Cyclone	Team Orion 12x3	Team Orion	Airtronics M8	Pro-Line 4-Rib/Losi X2000	21/78
6	5	Rick Hohwart	Team Losi XXX	Novak Cyclone	Peak Aurora 12x4	Peak	Futaba P3PJL	Losi Wide/Pro-Line Hole Shot	22/82
7	4	Jason Ruona	Associated B3	LRP IPC V7.1	Reedy Sonic II 10x4	Reedy	Airtronics M8	Pro-Line Radius/Square Fuzzie	19/81
8	10	Jouko Temonen	Associated B3	Tekin G12	Peak Aurora 10x3	Sanyo	KO	Pro-Line 4-Rib/Hole Shot	20/81
9	7	Lloyd Dassonville	Associated B3	LRP IPC V7.1	Reedy Sonic II 10x2	Reedy	Airtronics M8	Pro-Line Radius/Square Fuzzie	19/83
10	8	Teemu Leino	Schumacher	LRP IPC V7.1	Team Orion 11x2	Team Orion	Airtronics M8	Pro-Line 4-Rib/Hole Shot	17/92

Hohwart got around Masami and found nothing but open world championship real estate in front. Hohwart—after a long and wonderful career in the R/C hobby—was the oldest A-main finalist. What a great feeling for Hohwart to lead a field of the world's greatest drivers around the circuit for a couple of laps!

Masami got back around Hohwart and into the lead. The race half over, Masami developed a commanding lead, while Hohwart settled comfortably into second. Steenari had battled with Pavidis for third, but Pavidis rolled his car, and that gave Steenari tons of space. Moments later, the end buzzer sounded, and as the cars raced to the finish, it was Masami, Hohwart and Steenari in one, two, three, and Kinwald had made his way back to fourth. TQ Pavidis finished fifth.

Second leg. Kinwald reacted quickly to the buzzer and got around Pavidis at the start to claim the lead. Pavidis was second but rolled it going over the platform jump, and Hirosaka took over his position. On the very next corner, Pavidis regained second and Hirosaka was back in third. Over the triples they went: Hirosaka was back in second when Pavidis' car got loose going through the rhythm section. Meanwhile, Kinwald had gone in a blaze of glory.

Pavidis and Hirosaka battled for second place until they tangled going through the triples, so Easton claimed second, Pavidis fell back to third, and Hirosaka got tossed back to fourth in front of Steenari, who was waiting to better his position. Pavidis regained second by passing Easton in one of the corners and, within seconds, he closed the gap on Kinwald, who had enjoyed the lead for over 2 minutes. Once again, the triple section took its toll when Kinwald rolled over after a rough landing. Pavidis was now in the lead, and the spectators

went absolutely nuts! Pavidis and Kinwald shot down the straight-away side by side, rubbing tires the entire way, but Kinwald forced his way into the inside and passed Pavidis going into the corner—simply amazing racing!

As the clock clicked off the final seconds, Pavidis made one last gallant effort to pass Kinwald going through the triples, but Kinwald held on; Pavidis flipped over, and Kinwald had all the space he needed to win. Pavidis took second, while Easton held on to third.

Third leg. The championship was up in the air, but Kinwald was ahead on points, and Steenari was comfortable in second. Pavidis was in third place and Hirosaka in fourth. A win for any one of these drivers would clinch the championship! Kinwald got the holeshot but rolled over in the first corner as Pavidis muscled his way into the lead. Hirosaka ended up third behind Kinwald, while Easton rode it out in fourth. On the very next lap, Easton made his way around Kinwald to claim third, and Hirosaka made a brilliant pass on Pavidis to take the lead. It was now Hirosaka, Pavidis, Easton and Kinwald.

The running order never changed, and Hirosaka ran away with the race. With two wins in his pocket, he secured the 2WD World Championship for Japan (and Team Associated/Reedy). The amazing Hirosaka now has 10 world championship titles and that makes him the most successful R/C racer on the planet. Pavidis secured second with 18 points and Kinwald got third place with 17 points.

FINAL THOUGHTS

The '99 IFMAR 1/10-scale Electric Off-Road World Championships was monumental—filled with all the action and drama one would expect from a race of this caliber. The condensed racing schedule helped many more contestants experience the thrills of competing at the Worlds. The Rauma Auto Sport Club and the Helsinki Model Racing Club deserve recognition for orchestrating a wonderful event. Big congratulations for their fantastic accomplishments go to Team Orion/Team Losi driver Jukka Steenari and Team Associated/Reedy/Yokomo driver Masami Hirosaka. These guys are the best in the world—until the next Worlds comes along, that is.

*Addresses are listed alphabetically in the Index of Manufacturers on page 209. ■

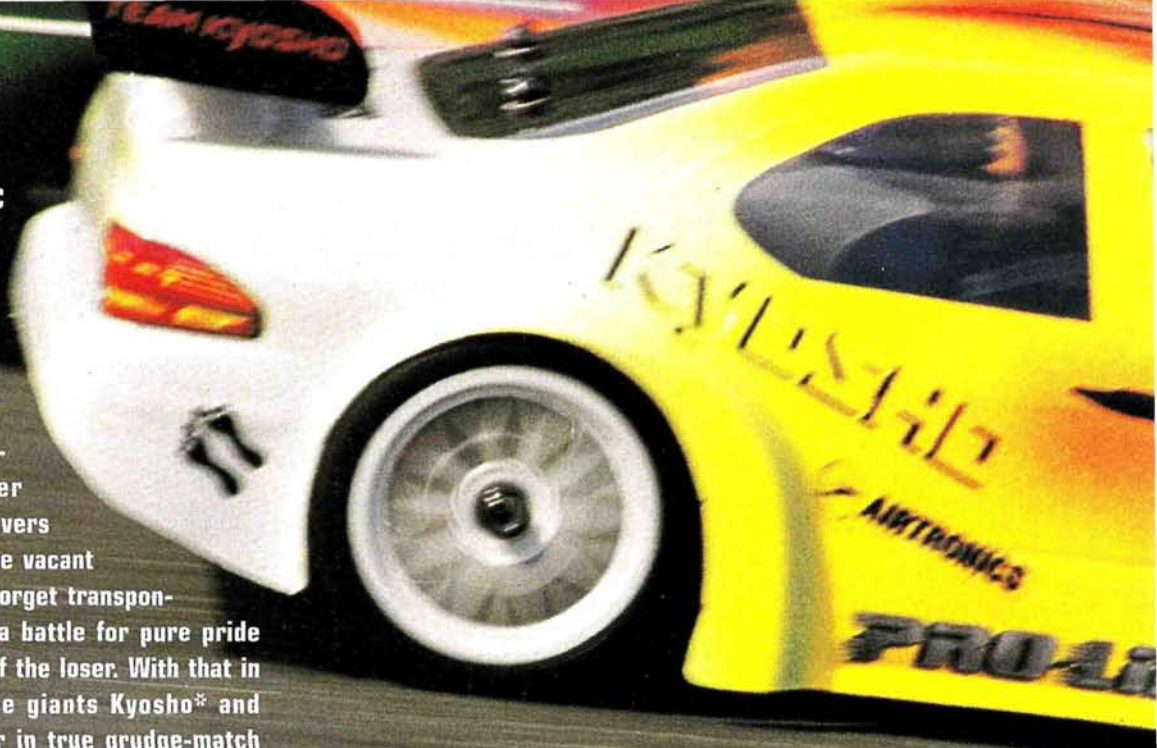


Philippe Neidhart can't help but smile; his team has just won a world championship!

O

rganized R/C racing is great, but the heart and soul of R/C

competition are the grudge matches—those no-rules contests that spontaneously occur whenever two R/C cars and their drivers find themselves on the same vacant lot or patch of pavement. Forget transponders and trophies; this is a battle for pure pride and the right to make fun of the loser. With that in mind, we pitted Japanese giants Kyosho* and Tamiya* against each other in true grudge-match form; we took each company's best nitro touring car, built each exactly as equipped from the box and went to a local parking lot to bang doors.

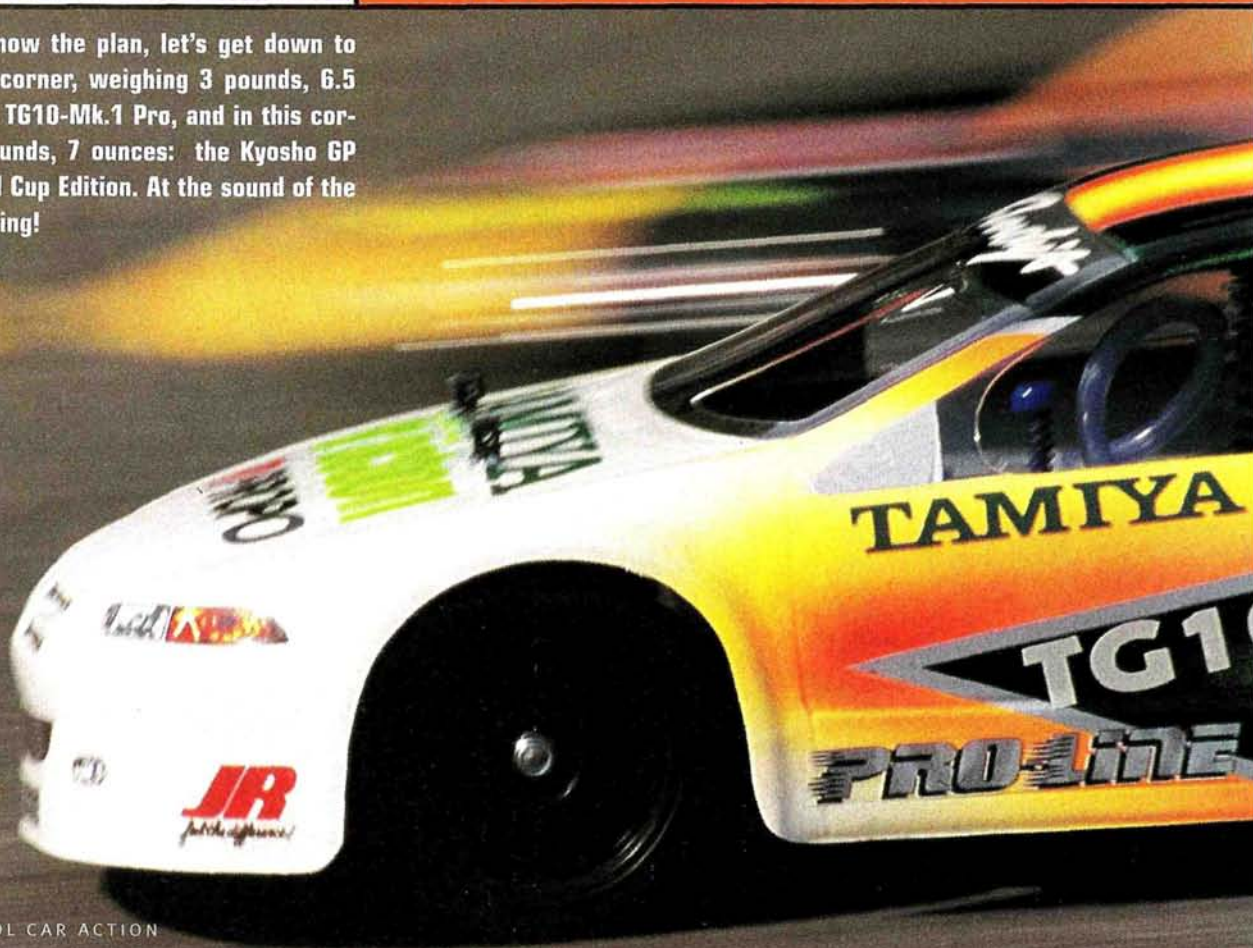


PHOTOS BY WALTER SIDAS

HEAD to HEAD

KYOSHO GP SPIDER TAMIYA TG10-MK.1

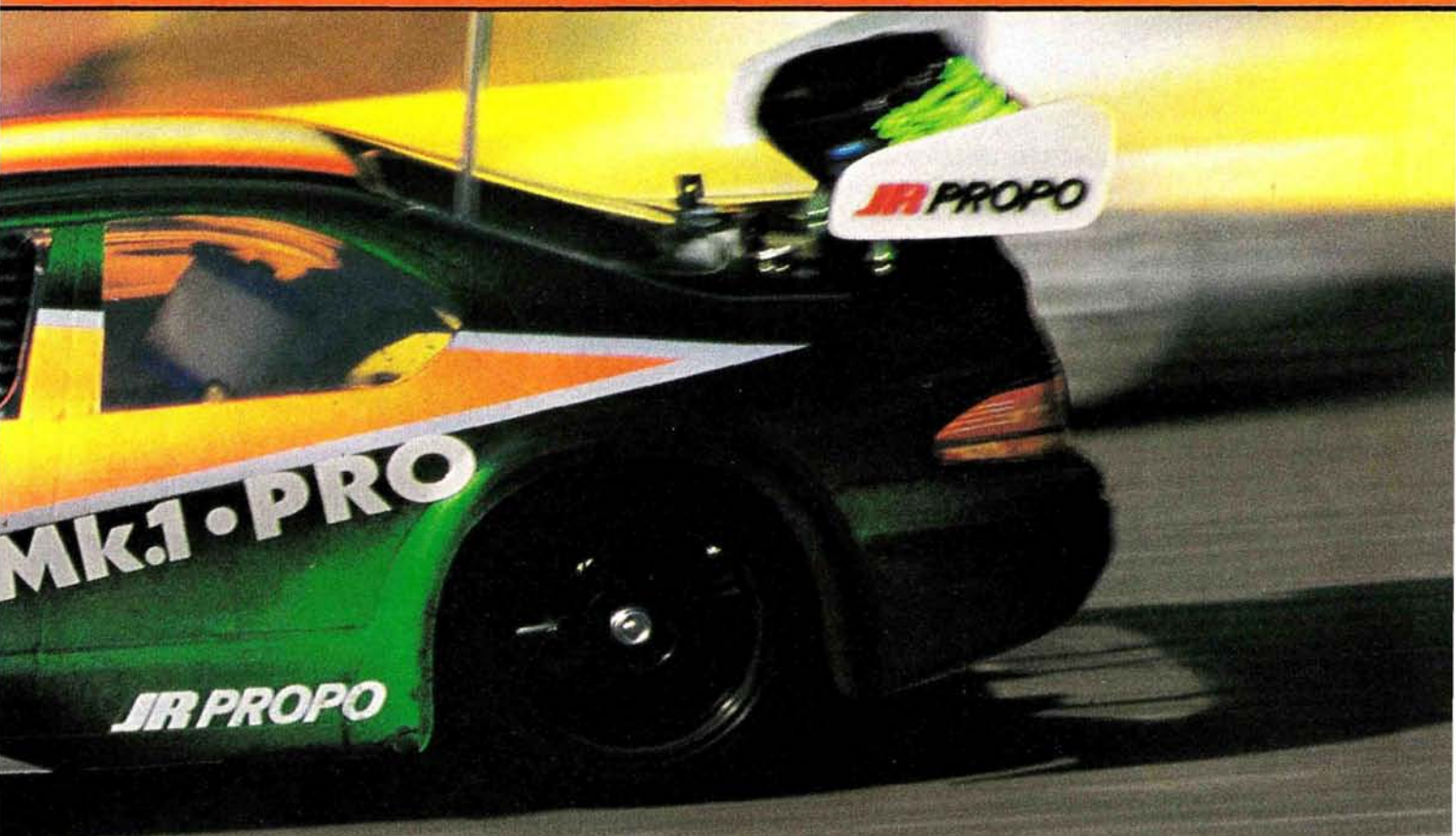
Now that you know the plan, let's get down to the battle: in this corner, weighing 3 pounds, 6.5 ounces: the Tamiya TG10-Mk.1 Pro, and in this corner, weighing 3 pounds, 7 ounces: the Kyosho GP Spider MK II World Cup Edition. At the sound of the bell, come out fighting!





MK-II WORLD CUP EDITION vs.

PRO *Rising-sun racer rumble* by Peter Vieira and Greg Vogel



The World Cup version of the GP Spider MK II is tailored for Kyosho's World Cup racing events in which only Kyosho cars and products may be used. Just about every hop-up you could want or need is included, so it's less expensive than buying the kit and hop-ups separately. The standard MK II's grease-filled gear diffs are used front and rear, along with the front bumper, nerf bars, radio-tray standoffs, center bulkheads and fuel tank. All the other parts are "World Cup" hop-ups; check it out:

KYOSHO GP SPIDER MK-II

SPECIAL WORLD CUP FEATURES

■ CHASSIS

Part no. KYOC4518. Kyosho supplies a lightweight, countersunk, blue-anodized chassis as a foundation for the WCE. The underside features beveled edges as well as the Kyosho logo in the chassis' natural silver color.

■ CARBON-FIBER UPPER DECK

KYOC2803. A strong, lightweight carbon-fiber upper deck supports the electronic equipment and fuel tank and stiffens the chassis.

■ SHOCKS AND SPRINGS

KYOC5703 and KYOC5858. Aluminum-body, oil-filled dampers grace all four corners. The kit supplies two-hole Teflon pistons, double O-ring seals and a cool, red-anodized shock cap. Kyosho's tuned springs slide over the outsides of the shocks (see detail 1 below).

■ TWO-SPEED TRANSMISSION

KYOC6174. A 2-speed tranny is a must if you use the supplied .11 engine. The shift point is adjustable via a small setscrew in the assembly (detail 2).

■ REAR STABILIZER

SPW-19. A rear stabilizer set reduces chassis roll through the corners. Only one bar is supplied: the aftermarket option includes two (detail 3).

■ TUNED EXHAUST SET

KYOC6153. To obtain maximum performance from your engine, you have to let it breathe. The restrictive canister-type muffler has been replaced with a manifold and tuned pipe that will allow exhaust gases to flow efficiently.

■ UNIVERSAL DRIVE SHAFTS

KYOC6120. Backlash, chatter and binding are common problems with dogbone drive shafts. Kyosho's efficient universal drive shafts eliminate these problems on the front of the World Cup car.

■ ADJUSTABLE TURNBUCKLES

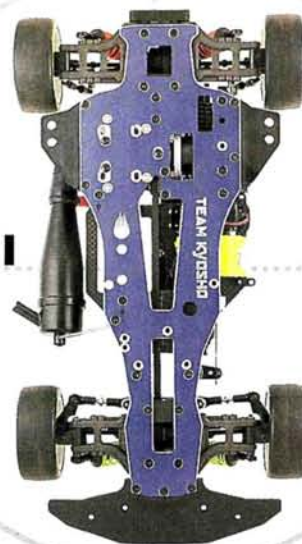
KYOC6175. Turnbuckles allow you to infinitely change the camber and toe of the wheels—a must-have when setting the car up for different track surfaces and after a ride-height change.

■ HARD SUSPENSION ARMS

BV-3H. The stock GP-10 arms tend to flex a lot. Kyosho's hard arms reduce flexing for better handling and response.

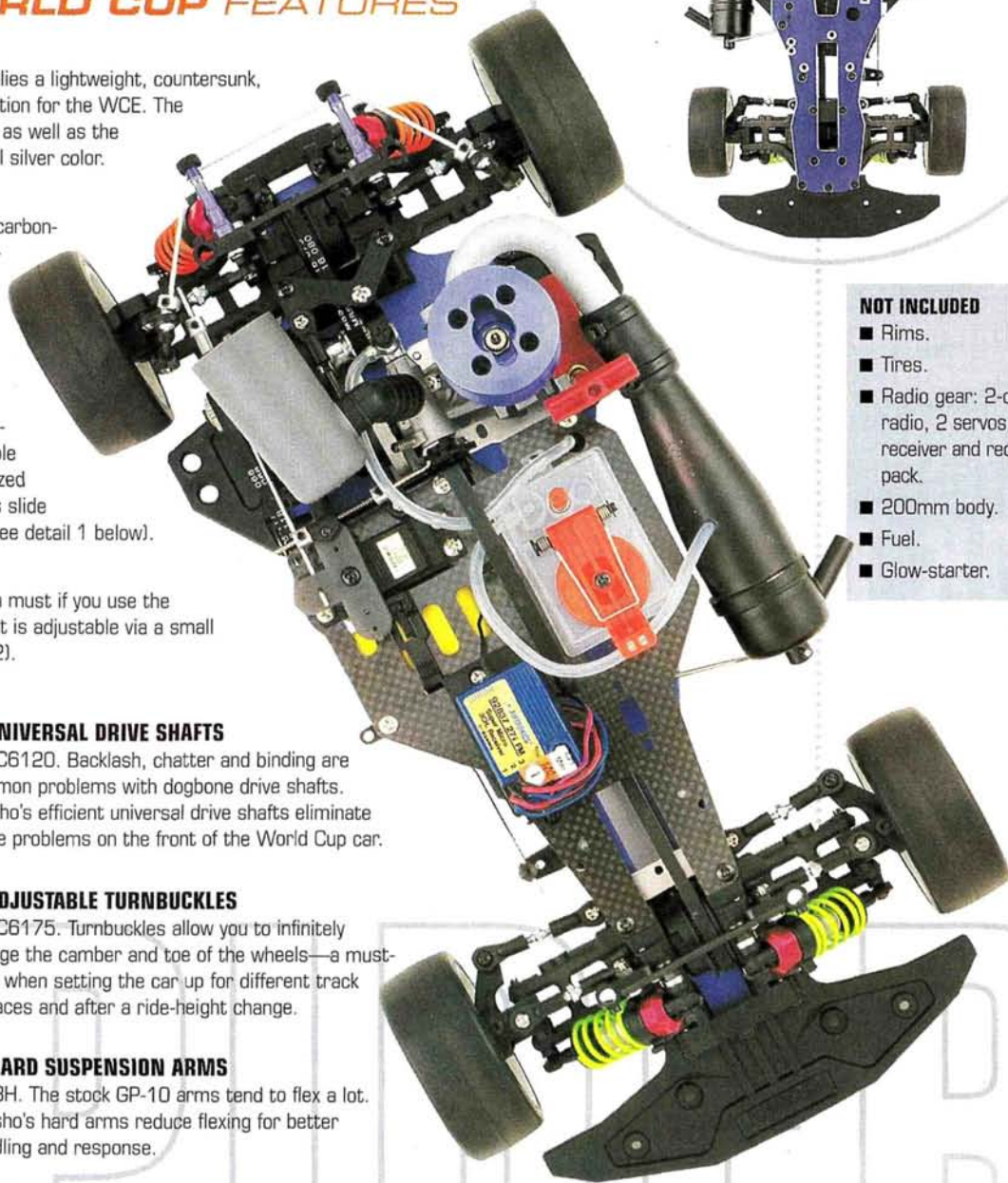
■ CARBON-FIBER FRONT AND REAR SHOCK TOWERS

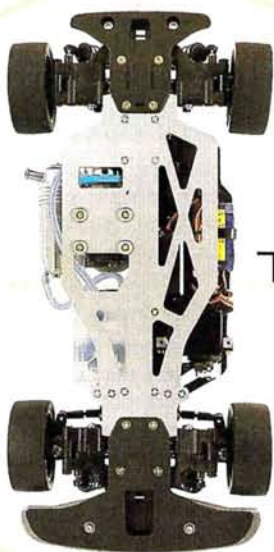
KYOC2789 and KYOC2700. Since most of the other parts make this a solid car, you may as well stiffen up the shock towers, too. Kyosho provides carbon-fiber towers front and rear.



NOT INCLUDED

- Rims.
- Tires.
- Radio gear: 2-channel radio, 2 servos, receiver and receiver pack.
- 200mm body.
- Fuel.
- Glow-starter.





The TG10's basic layout is simple: the engine is mounted on the left side of the chassis with the clutch facing the rear of the car. The clutch bell is mated with a shaft-mounted spur gear, and the shaft spans the chassis to mate with the front and rear gearboxes, which are identical. The diffs use Tamiya's rugged, 3-gear internals, and power is transferred to the wheels by dogbones in the rear and universals up front.

The suspension is equally simple and effective and relies on two-piece A-arms and threaded camber links for articulation and on oil-filled shocks for bump absorption.

TAMIYA TG10-MK.1 PRO

SPECIAL PRO FEATURES

NOT INCLUDED

- Side-exhaust .12 to .15 engine.
- Canister muffler or tuned pipe and TG10-specific manifold.
- Air filter.
- 190mm body.
- Radio gear: 2-channel radio, 2 servos, receiver and receiver pack.
- Fuel.
- Glow-starter.

■ GRAPHITE UPPER DECK

Part no. 53356. This piece replaces the molded upper deck/radio box found on the stock TG10. It boosts chassis stiffness, trims a few grams, and it looks killer (see detail 1 below).

■ DURALUMIN CHASSIS PLATE

53367. Duralumin is a very hard alloy used in applications where high strength and low weight are critical. The TG10 Pro's 3mm chassis has been liberally relieved of excess material yet remains suitably stiff. Reliefs have been cut into the nose and tail sections to accommodate molded front and rear bumper/skid plates.

■ SEALED BEARINGS

53352. Tamiya's free-spinning, maintenance-free, blue-seal bearings are some of the best in R/C.

■ FRONT UNIVERSAL AXLES

53115. The TG10 Pro does away with dogbone chatter and backlash by spec'ing smooth-turning universal axles up front. The universals also improve steering precision by reducing binding under power.

■ ALUMINUM BALL STUDS

53284. Aluminum studs replace the heavier brass-colored pieces typically used to mount the shocks and tie rods. The meager weight savings per piece adds up; the 12 studs trim 8 grams from the TG10 Pro.

■ SWAYBARS

53354. Each end of the car is fitted with a swaybar to counter chassis roll. The 2mm wire used to form the swaybars seems awfully thick, but the bars' long arms make them more flexible than they look.

■ FINNED ENGINE MOUNTS

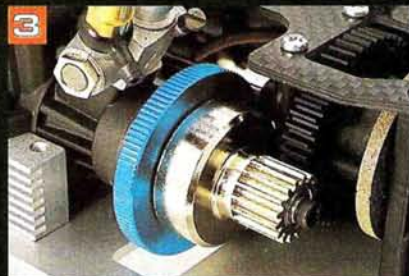
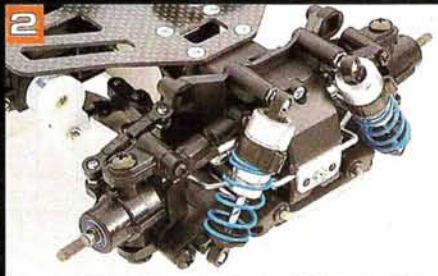
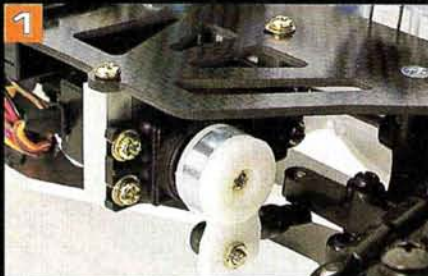
3242. These provide a bit of extra heat dissipation and simply look trick. Two sets of holes with slightly different offsets allow the mounts to fit just about any .12 to .15 engine.

■ LOW-FRICTION DAMPERS

53280. With their Teflon shaft guides, Teflon pistons and Teflon-coated bores, you could leave out the oil and still have super-smooth shock action with these trick aluminum shocks. Tamiya includes silicone shock fluid but does not specify which viscosity. Blue springs (the stiffest Tamiya offers) are supplied for both sets of dampers (detail 2).

■ LIGHTWEIGHT FLYWHEEL

53208. The stock TG10 flywheel is a heavy hunk o' steel that is great for maintaining a reliable idle but not so good for snappy acceleration. The Pro's much lighter aluminum unit makes the throttle more responsive (detail 3).



PERFORMANCE

WHY THE TG10 PRO AND KYOSHO WORLD CUP?

First, there's the rivalry factor: Tamiya and Kyosho are the two brands that epitomize Japanese R/C, and each company brings its own unique spin to R/C car design. In addition to being natural competitors, these two cars reflect similar design goals: specifically, each is offered as the top-of-the-line version of each company's nitro touring car. If two guys were to walk into a hobby shop and say, "We want two of the most tricked-out gas touring cars ya got," these are the two we think they would walk out with. And that's why they're the subject of our head-to-head shootout!

SETUP

In keeping with the box-stock, grudge-match format, we first tested the cars with their factory-supplied equipment, assembled exactly as their instruction manuals suggest. However, we did have to add some parts; the Spider WCE does not include wheels, tires or a body, and the Tamiya TG-10 Pro omits an engine, manifold and pipe and body. Although the test plan did not call for the cars to be identically equipped, we did feel the "not included" items should not give one car an advantage. With that in mind, we completed the Spider with Kyosho standard-width rims and basic kit slicks to match the TG10's supplied rubber, and the TG10 was given an O.S. * CV .12 engine that was paired with a Tamiya canister muffler.



The CV was chosen because it reflects the popular choice in .12-size engines; it was picked as our "Readers' Choice" two years in a row! Also, both cars were given prepainted Stratus bodies from Andy's* (another "Readers' Choice," although we picked 'em primarily because they're already painted!). Notably, the TG10 requires a 190mm shell while the Spider accepts the nitro-standard 200mm style.

That's the setup story. Time to test!

RADAR TESTING

Naturally, the performance of the TG10 Pro will vary with engine selection, but as noted above, many buyers will outfit the car with an O.S. CV, so

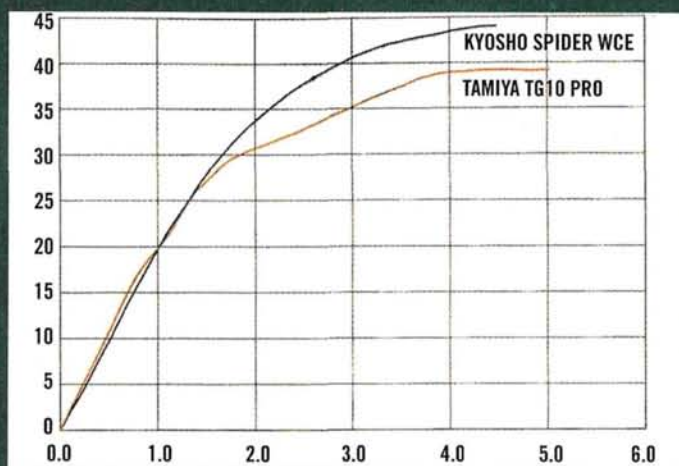
there is plenty of relevance to the tests. Both cars were fully broken in and leaned out for maximum engine-safe performance, running on 20-percent nitro fuel. These comments will help flesh out the chart data:

■ The O.S.-powered TG10 Pro is just a tick quicker out of the hole, but it succumbs to the Spider WCE as its powerband flattens out. That's an engine issue, not a Tamiya problem, but Tamiya can be blamed for not providing the unusual manifold the TG10 requires. With a tuned pipe, the TG10 would probably better pace the Spider. As it stands, its canister muffler does not allow the O.S. CV to breathe at top speed.

■ Can you spot the shift point on the Spider's acceleration curve? Neither can we, but for the record, the tranny shifts at about the 0.5-second mark. The car's drive-dog-type 2-speed isn't known for shifting smoothness, but the Kyosho unit snicked into second almost silently. For best performance with the supplied gears, the Kyosho GS11X engine likes an early shift.

■ Despite its 5mph top speed advantage, the Spider doesn't open a real gap on the TG10 until both are deep into their runs; note the distances traveled at the 3-second mark. On a typical race-track, the TG10 should be able to hang with the Spider, no problem (at least as far as acceleration is concerned); but when it comes to "Wanna race?" grudge competition, the idea is to stay on the gas until one car drops back, and that will be the TG10 Pro.

SPEED, mph



TIME, seconds

	KYOSHO SPIDER WCE	TAMIYA TG10 PRO
TOP SPEED (MPH)	44.01	39.24
ELAPSED TIME TO TOP SPEED (SECONDS)	4.48	4.54
DISTANCE (FEET) TRAVELED IN:		
1 SECOND	14.9	16
2 SECONDS	55.4	55.02
3 SECONDS	110.7	103.3
4 SECONDS	172.7	158.2

TRACK TESTING

The "standard slick" tires we first shod both cars with were great for sliding around like dirt-trackers, but they didn't have enough grip to reveal the car's true handling characteristics. To give a true test, both cars were outfitted with Pro-Line* LP Sedan Slicks in the S3 compound. Fresh tires transformed their handling; here are our notes for each:

KYOSHO SPIDER WORLD CUP EDITION

■ **Cornering speed.** I spent a few minutes wrenching on the chassis to get it untweaked before I could make a good run at the sweeper we had set up to test cornering speed.

I noticed the car tends to push in the turns even with the sticky Pro-Line tires—nothing too dramatic though. I actually preferred push to having the car loop out in the corners, and the Spider didn't scrub a lot of speed.

■ **Transitional handling.** The Spider handled well when powering out of corners onto straights, but it did tend to get a little out of shape when exiting one corner with the racer slamming the wheel to full opposite lock to set up for a corner in the opposite direction. Although the car remained under control, I had to let off the throttle to reel in the back end, and that resulted in a longer lap time.

■ **Acceleration.** The Spider did not like being launched aggressively from a standstill with the hard slick tires we used for the first round of testing; it got a little squirrely, and I needed to back off the throttle to allow the chassis to regain its composure. Stickier tires made all the difference in the world, and with them, full-throttle takeoffs were no problem.

■ **Braking.** The kit's vented, stamped-steel brake is one of the best on the market, in my opinion. Two steel plates with fiber pads clamp down on the disc to slow the car. Once properly set up, this system slows the car consistently with no pulsing or locking.

■ **On-center tracking.** When the car was freshly built, steering slop was minimal. But after just a few tanks of fuel and a couple of close encounters with a corner board, some play was evident and the car wandered on long straights.

OVERALL

I can say the Spider was not only a pleasure to build but also was great to drive. Every part fit well. All of the options necessary to make the Spider a high-performance car are included. With the stock engine and kit setup, the car's handling was manageable even with less-than-grippy "standard" tires. The aftermarket Pro-Line meats were a definite bonus and dialed the

car in even more. Out of the box, the Spider proved to be king of the parking lot in this comparison test, and with a little more fine-tuning and an upgraded engine, it's certain that it will hold up well in competition against other loaded sedans.

—Greg Vogel

TAMIYA TG10

■ **Cornering speed.** The TG10 will carry quite a bit of speed through wide sweepers, but it suffers when pushed hard into a turn. The thick swaybars seem to overwhelm the shocks, and the Pro likes to lift its inside front wheel. The diff then unloads, and the car pushes wide. The Pro will tighten its line when you get off the gas, but that will slow your lap times.

■ **Transitional handling.** Although Tamiya's blue springs are the stiffest the company offers, they aren't firm enough to keep the TG10 well-planted when sawing at the wheel. Stiffer springs would certainly help, but in stock trim, the chassis rolls heavily and responds slowly to direction changes. It takes only a couple of hard inputs at the wheel to loop the car.

■ **Acceleration.** The TG10 can be launched full throttle without getting loose, and even the stock tires allowed crisp acceleration without lighting up the tires or unloading the diffs.

■ **Braking.** The fiber brake disc supplied with the TG10 runs true and had a solid, progressive feel. No pulsing was detected, and full lockup was easily achieved whenever the urge to perform power slides came up.

■ **On-center tracking.** The slop in the TG10's steering linkage and camber rods made the car feel numb, and constant input was required to keep the TG10 tracking straight. Tamiya should include its slop-reducing sleeved screw kit to replace the old-tech pivot screws supplied.

OVERALL

I know what you're thinking: "Boy, Pete really doesn't like the TG10 Pro!" The truth is, I *do* like it; it's fun to build, the legendary Tamiya quality is there, and it absolutely, positively can be tuned to run with any other 1/10 nitro touring car. However, out of the box, the setup just isn't right. The springs are too soft, the swaybars are too heavy, and there's just too much slop in the front end. The good news is it's easy and cheap to dial out those weaknesses, and all the included hop-ups guarantee you'll have a stellar racecar when you've finished. But for this "shootout" format, it's stock versus stock, and the TG10 is well-equipped, but not well-tuned.

—Peter Vieira

comments

KYOSHO

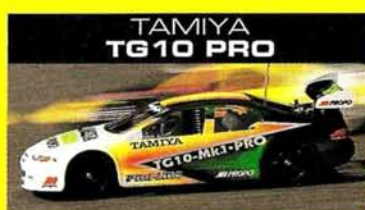
■ The World Cup Spider went together in true Kyosho fashion. Each part mated with another without any extra hand-fitting. I was very impressed with the set of diff gears. In past kits, similar diffs felt "notchy" when assembled. The

World Cup kit's diffs went together easily and felt silky smooth from the get-go.

■ Where's the meat? Kyosho doesn't supply tires or rims with the kit.

■ Just about every hop-up option on Kyosho's list is included with the car, so why did they leave out the foam bumper? It's necessary, in my opinion; not only does it protect the front of the car, but it also prevents the body from chattering.

■ If you plan to install an engine other than the GS11R, you'll need to buy a new flywheel and engine mounts. The stock engine has the mounts cast in the block, and the flywheel fits only the Kyosho engine.



pipe, and the required part is not common. We resorted to running the canister muffler from a stock TG10.

■ All the kit's parts are of top quality, but the infamous linkage slop that is typical of Tamiya cars is also evident in the TG10 Pro.

■ Where are the sticky belted slicks? The Pro should have better rubber than the ho-hum kit slicks. Tamiya has its own line of high-performance tires. Why not put them in the box?

■ The carburetor linkage is a little short; the carb of the O.S. CV we installed had to be angled to allow full throttle throw.

■ Like just about every other Tamiya kit, the TG10 Pro is a breeze to build. However, you can expect to get stalled along the way if you plan to run a tuned pipe; the TG10 requires a special manifold to accept a tuned

resorted to running the

TAMIYA

FINISH LINE

It didn't take us long to realize that the Kyosho Spider World Cup Edition outclasses the Tamiya TG10-Mk.1 Pro in terms of pure performance—at least in box-stock trim. If you head straight to the parking lot after hitting up the hobby shop for the World Cup Spider and TG10 Pro, you can expect to see the same results as we did. However, it would not be fair to suggest that the results we had with the cars represents the final word on them; after all, they are aimed squarely at the "tuner" crowd: racers and enthusiasts who tweak a chassis to deliver the best possible performance. With that kind of attention, the disparity between the Kyosho and Tamiya "hop-upmobiles" will all but vanish. For factory-equipped, head-to-head comparison, the Kyosho Spider World Cup Edition is the top Japanese hot-rod touring-car kit, but don't think you've seen the last of these two tourers; given the lopsided results, the Tamiya TG10 Pro is due for a rematch. With a tuned pipe, 2-speed and some careful steering-slop-reduction measures, you can expect Big T to come out swingin'. Look for a follow-up report on the TG10-Mk.1 Pro soon.

ratings	KYOSHO SPIDER WCE	TAMIYA TG10-MK.1 PRO
Ease of assembly	9	9
Completeness	7	6
Cornering speed	7	6
Transitional handling	7	6
Acceleration	8	8
Braking	9	9
On-center tracking	7	5
TOTAL	WINNER 54	49

HOW WE RATED THEM

■ EASE OF ASSEMBLY.

High scores reflect precise parts' fit, clear instructions and a good time at the workbench.

■ **COMPLETENESS.** The manufacturers of the kits reviewed here emphasize included hop-ups as their primary selling points, so, at the very least, we expect them to include essentials such as full bearings, a manifold and pipe, turnbuckle linkages and aluminum shocks. More included parts means more points.

■ **CORNERING SPEED.** It's great to have a fast car on the straights, but that speed is of no help if the car can't get through a turn without slowing dramatically. We set up a long straight going into a wide sweeper and sent each car through for a number of passes to see just how much speed each could carry around the corner; the faster the cornering speed, the higher the score.

■ **TRANSITIONAL HANDLING.** Another critical facet of touring car handling is their ability to transition between left- and right-hand turns without spinning out or traction-rolling. Each car was blasted through a set of S-turns to test the stability of the chassis.

■ **ACCELERATION.** We radar-tested the cars to obtain their true speeds, and we also rated them subjectively for their ability to launch cleanly and track straight under power.

■ **BRAKING.** Only rank novices believe being able to lock all four wheels is a sign of a high-quality brake system; experienced racers know that precise deceleration control is key. High points were awarded for setups that permit hard braking without lockup and smooth, pulse-free braking when scrubbing just a little speed.

■ **ON-CENTER TRACKING.** A racecar's steering should center precisely, and the chassis should track straight without requiring constant trimming. A high score means the car did just that.

FEATURES

	KYOSHO SPIDER WORLD CUP EDITION	TAMIYA TG10-MK.1 PRO
Bearing type	Shielded	Sealed
Chassis (material/thickness)	Aluminum/2.41mm	Duralumin/3mm
Upper deck (material/thickness)	Graphite/2mm	Graphite/2mm
Differentials	2-gear	3-gear
Manifold	Yes	No
Pipe	Tuned pipe	No
Shocks	Hard-anodized aluminum	Teflon-coated aluminum
Swaybars (F/R)	None/1.5mm	2mm
Brake	Fiber disc	Fiber disc
Foam bumper	No	Yes
Tires	No	Firm slicks
Tire inserts	No	Soft foam strip
Wheels	No	Tamiya 5-spoke
Drive axles (F/R)	Universal/dogbone	Universal/dogbone
Engine compatibility	Pull- or bump-start .12 to .15	Pull- or bump-start .12 to .15
Engine	Kyosho GSX11-R	No
Camber links	Steel turnbuckle	Threaded steel
Fuel capacity	75cc	75cc
Wheelbase	260mm	257mm
Width (F/R)	198mm	180/183mm
Transmission ratio	2.21:1	2.6:1
Clutch/spur	12/43 (1st gear), 16/40 (2nd gear)	16/50
Final drive ratio	7.92:1 (1st gear), 5.53:1 (2nd gear)	8.45:1
Weight, RTR as tested	54.5 oz.	55.1 oz.
Retail Price	\$469.99	\$489.00

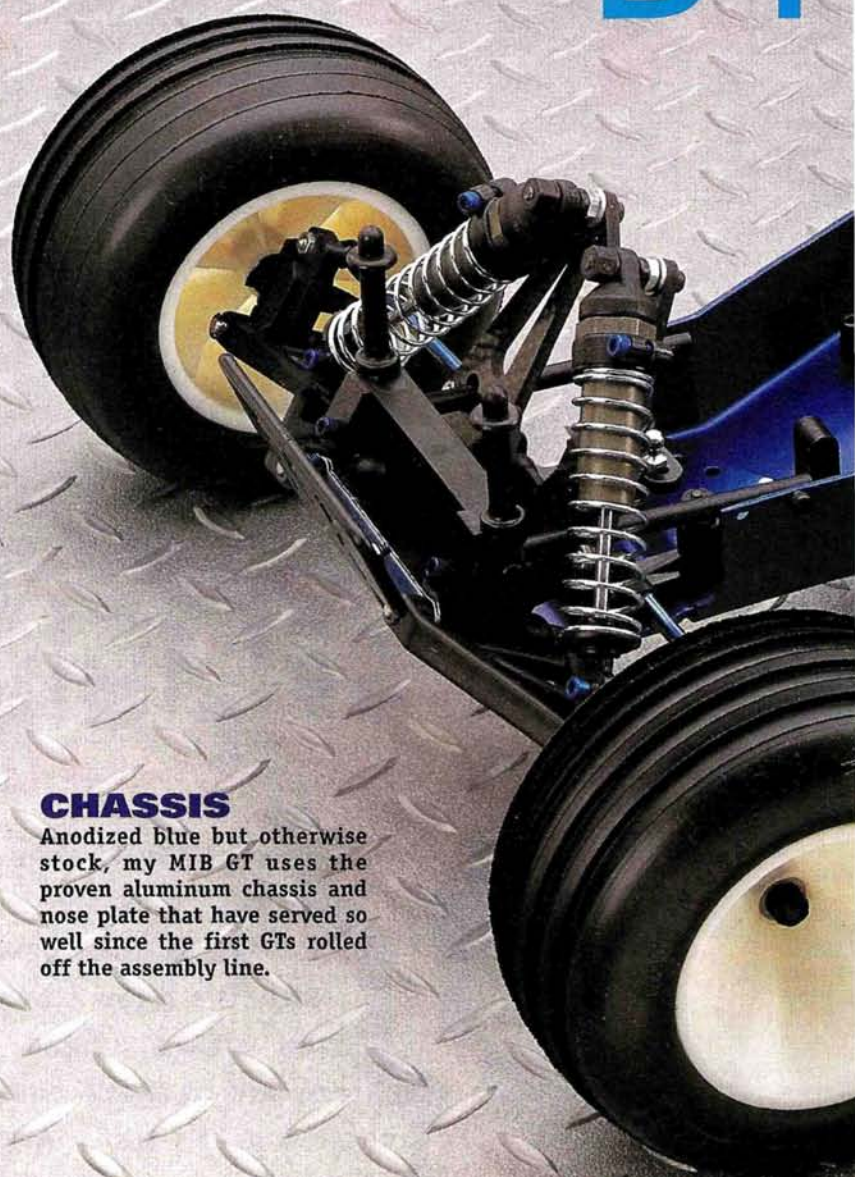
*Addresses are listed alphabetically in the Index of Manufacturers on page 209. ■

Team Associated's* RC10GT was introduced almost six years ago when there was very little nitro-truck racing activity. It wasn't the first of its breed, but much like the original RC10 buggy, it elevated its racing class to entirely new levels of performance and participation. The modern GT is very similar to the truck that first appeared in early 1994; in fact, other than an early update of its T2-type suspension, much of the GT truck remains in its original form. Despite its aging design, the GT still remains a dominant force in 1/10 nitro-truck racing.

Although Associated certainly gets credit for delivering great value with its existing line of vehicles, no car or truck so far offered by them meets the needs of cost-no-object performance junkies who want every possible option right in the box.

As someone who suffers from the gotta-have-it-all addiction, I recognized an opportunity for a "fix" with the increasing number of Associated Factory Team parts for the GT. Even though there is currently no "Factory Team" edition of the GT to satisfy my compulsion, there is certainly nothing to keep me from building one using all the factory's trick parts! This truck represents what I would imagine a Factory Team GT to be. It has every available factory option—be it eye candy or true performance-enhancing accessories—that's offered in the "MIB" (machine in blue) line.

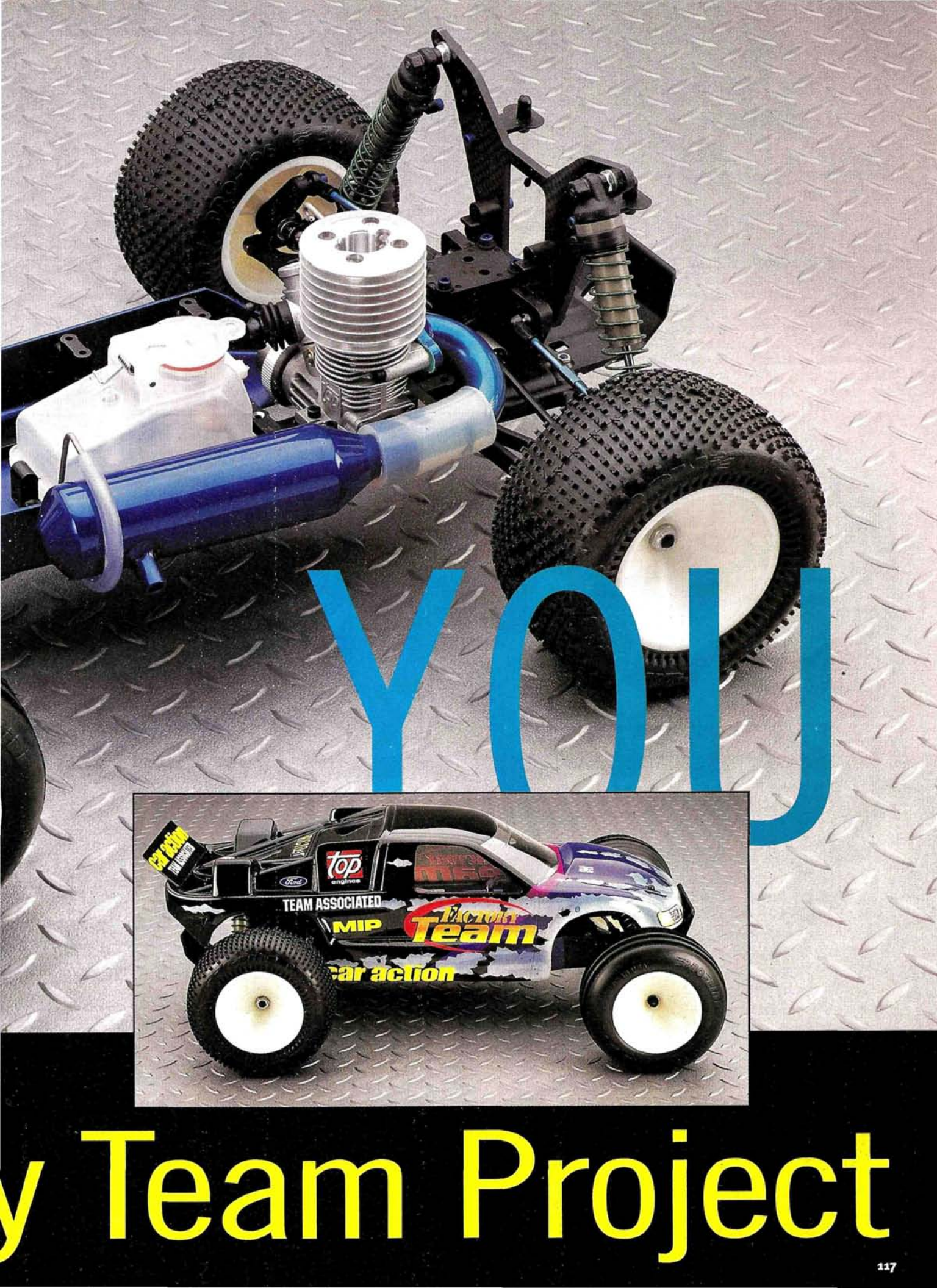
BLUE BY



CHASSIS

Anodized blue but otherwise stock, my MIB GT uses the proven aluminum chassis and nose plate that have served so well since the first GTs rolled off the assembly line.

Associated by Steve Pond RC10GT Factory



YOU



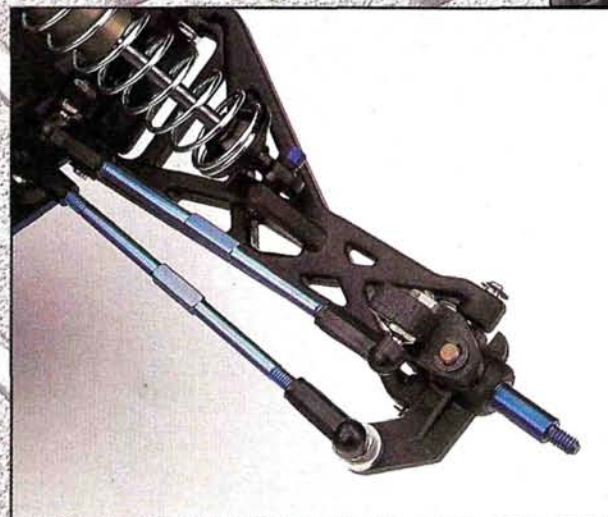
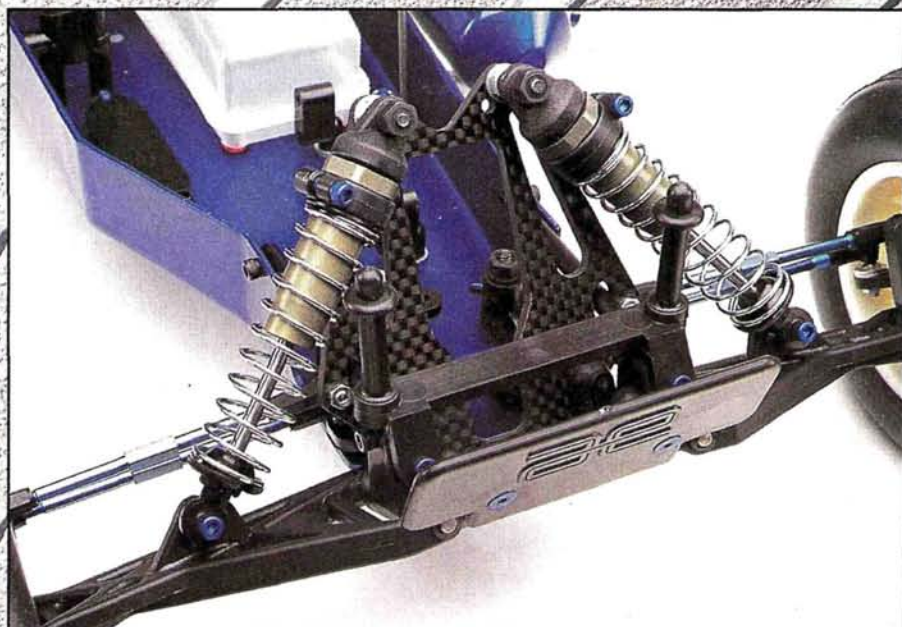
y Team Project

Associated RC10GT Factory Team Project

SUSPENSION AND STEERING

Associated's hard-anodized shocks—identical to those included in the Team kit—also appear on my MIB GT. I decided to include the slippery, long-wearing Unobtanium shock shafts as part of my project. These shocks are secured to graphite shock towers—an accessory that's not included on any version of the GT.

Blue-anodized titanium tie rods and camber links reach out to the hubs. The rest of the suspension is standard TA-issue GT, with the exception of blue-anodized-aluminum in-line front axles. Hanging from the ends of each



axle are Team Associated white wheels instead of the more common fluorescent yellow.

Special blue-anodized-aluminum steering posts are the only addition to the GT's standard steering bellcranks that push Factory Team blue-anodized titanium linkage rods. The camber links are also blue titanium.



AFTERMARKET BLUES — more trick stuff for the GT!

The popularity of the RC10GT, combined with its relatively unchanged design, makes it a primary target for aftermarket manufacturers. Literally hundreds of accessories are made for it, and sorting out which are the most effective is a daunting task. Listed here are aftermarket products that I think are worth buying to make the FTGT even more formidable.

I certainly can't cover everything that's available, and you don't need everything that's listed here, but my GT wish list would include all of these products.

TRINITY/TEAM KINWALD

• **Chassis brace/engine mount.** An important piece of equipment for the GT, it shores up the rear of the chassis where it has a tendency to flex under heavy loads. This flexing can cause gear-mesh problems that may lead to "finishing-the-race" problems. This is the single most popular chassis brace for the GT.



• **Transmission brace.** The tranny brace complements the chassis brace and is the final link in making the chassis virtually flex-free. It joins the transmission and the rear bulkhead, and when combined with the chassis brace, it virtually guarantees that you will not lose a spur gear to chassis flexing.

• **Cylinder head.** This is more specific to the truck shown on these pages, as it is equipped with a TOP CT12 engine. This head is designed to fit all TOP and NovaRossi engines and reportedly reduces running temperatures by 15 degrees. A head is also available for the O.S. 12 and 15 CV engines,

which lose up to 30 degrees of running temperature! Cooler temps result in more power output and engine longevity, so put it on your list.



HAMMAD GHUMAN

• **Aluminum bulkhead.** This, unfortunately, is not available in blue, but it is one of national champion Richard Saxton's mods of choice. The Hammad Ghuman* aluminum bulkhead



ENGINE ACCESSORIES

The MIB GT includes the same standard black aluminum engine mounts that came with the original Team kit. Although you might think this Team Edition-based high-performance GT would only accommodate non-pull-start engines, it can be fitted with pull-start engines as well. Simply adding spacers under the engine mounting tabs allows enough clearance for a pull-starter mechanism. The starting system chosen will determine the size of the flywheel (pull-starter engines use a larger flywheel) and whether engine spacers are needed to raise the engine for pull-starter clearance. I have even gone so far as to ask the folks at Associated whether they ever considered anodizing the flywheel for the blue effect. They apparently decided against it because the anodizing would be rubbed off when the starter box is used. A two-shoe clutch is standard, so I at least opted for the four-shoe setup, even though it's not blue.

A blue-anodized header and tuned pipe are available to fit your choice of side-exhaust engine. Their performance is no different from the stock exhaust pieces, but they fall right in line with the MIB GT blue theme.

Should you go blue?

Although there isn't a Factory Team edition of any Associated vehicle at present, there is a long list of factory parts that, when combined, would closely resemble that of a factory release. There has been random talk of an Associated release along these lines, but if you're like me and can't wait for that, build your own.

Will my MIB GT set new performance standards for the venerable GT? Yes and no. Some of the hop-ups I included can also be found on many of the successful GTs that currently race. This truck is generally stronger and lighter than anything rolling off the assembly line, so it offers subtle performance and durability gains for those with enough skill to exploit them. Some of the visible differences are purely eye candy, but this truck is a well-optioned machine that will at least turn some heads, if not quicker lap times!

is simply more durable than the stock unit; it will keep you on the track and out of the pits.

PROGRESSIVE SUSPENSION

• **Reservoir caps.** Richard Saxton also chooses Progressive* reservoir caps because they provide greater volume of damping fluid for more consistent operation and more progressive damping.

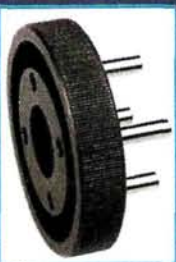


This prevents the truck from bottoming out over the big jumps while it keeps everything smooth over the wash-board sections.

MIP

• **4-in-1 flywheels.** A popular GT option is a 4-shoe clutch. MIP's* 4-in-1 flywheels provide

a 4-shoe clutch and, depending on the material chosen, help fine-tune engine performance. They're available in aluminum or heavyweight steel: aluminum units provide snappy acceleration, but they compromise idle quality, and the steel ones improve idling and soften throttle response.



• **Temperature gauge.** This is an absolute must-have. Poor fuel-mixture settings that result in excessive engine temperature are probably the number-one



causes of engine damage. Properly installed, the MIP temperature gauge can give you instant, accurate engine-temperature readings. There are more expensive alternatives, but the MIP gauge will give you the best bang for the buck. If you plan to buy only one of the products listed in this section, make sure it's this one!

ROBINSON RACING

• **Lightweight slipper.** If you lean toward snappier throttle response, Robinson Racing's* lightweight slipper clutch could help you toward that goal. The

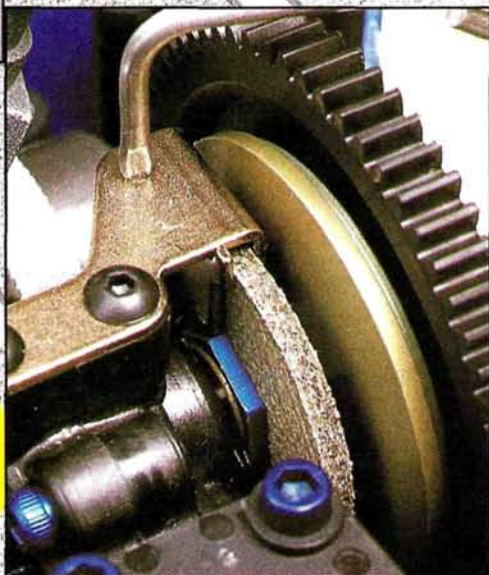


slipper plates are machined to remove all unnecessary material; this reduces rotating mass, and combined with a lightweight flywheel, will deliver best-in-class acceleration.

TRANSMISSION

The MIB GT's transmission wasn't changed inside, but it has a few extra performance goodies on the outside. For starters, I installed a new aluminum brake adapter. It's the same as the previously optional aluminum brake adapter, but it has been anodized in—you guessed it—blue.

A large-diameter slipper clutch originally from the T3 is included in the new Team kits (a frequent mod of the old GT faithful), so I was spared having to get one of the big slippers. A pair of stock MIP steel CVDs puts the power to the rear wheels. I considered replacing them with the chrome-plated shiny CVDs but felt that it could wait until the steel units show signs of wear.



• **RPM RC10GT Heavy-Duty Body Mounts.** It's well-known that the RC10GT's stock body mounts, especially the rear ones, will come apart in a crash. RPM's* beefed-up, heavy-duty mounts are the cure. Designed as direct



replacements, they are made of much stronger material than the original equipment, yet they are still flexible enough not to break in a crash.

*Addresses are listed alphabetically in the Index of Manufacturers on page 209.

Trinity's Joel Johnson claims 1/10 and 1/12 ROAR On-Road Nats titles

Team Trinity driver Joel "Magic" Johnson proved to the world that he still has that magic by winning the highly competitive 1/12- and 1/10-scale Mod classes at the '99 ROAR Electric On-Road Nationals in Ripon, CA. Joel's Trinity-powered Switchblades took the pole position in both classes after posting a 19/4:04.44 in 1/10 and a 37/8:09.56 in 1/12.

Team Trinity's Josh Cyrul qualified behind Joel in both classes, while teammate Brian Kinwald qualified third in 1/12.

Joel went on to take the first of the two 1/10 triple A-mains to easily win the class, but a tie-breaking decision between Joel and Josh was necessary to determine the winner in 1/12. Joel's faster throw-out round clinched his second national championship of the weekend.

In the heavily attended Touring Car class, Team Schumacher's Chris Tosolini was the man to beat with a TQ time that was more than 8 seconds faster than the second-place qualifier's—Team Associated/Reedy's Billy Easton. Billy drove Team Associated's new TC3 touring car—the first time the car had been raced at a large national event.

After winning the first two rounds of the triple A-mains by a huge margin, Tosolini ran away with the championship.

We'll provide complete coverage of the ROAR On-Road Nats in the next issue, so stay tuned.

Mugen's Adrien Bertin conquers the 1/8-scale IC On-Road Worlds

The IFMAR 1/8-scale IC (internal combustion) On-Road World Championships was held in France, and all the major 1/8-scale, on-road teams were present to stake their claims on IFMAR history. Reigning champion and Team Serpent driver Lamberto Collari of Italy was the favorite going into the race, but at the end of the hour-long main event, French driver Adrien Bertin, driving a new Mugen MRX-2, crossed the line first to take the win and the world championship. Team Serpent drivers Daniele Ielasi and Masimo Fantini, both of Italy, finished second and third, respectively, after each completed 212 laps—one lap less than Bertin. As a footnote, French driver Christopher Aygon claimed fourth after completing 211 laps, and that placed another Mugen MRX-2 in the top 10 at the Worlds. Congratulations to Adrien Bertin and Mugen for their accomplishments.

Top Reinvents the Budget Engine

The highly anticipated "sport" version of Top's popular C12 engine is finally available, but after



checking out its high-performance features, it just doesn't seem right to call it a "sport" powerplant! To keep the price down, the new ET-12 features a nickel sleeve instead of the chrome sleeve used on the top-of-the-line C12, and the engine also comes with a rotary carburetor (not shown) for easy installation on most nitro vehicles. You'll also find a high-performance, two-piece head, but it is not anodized and lightened as on the C12. Both pull-start and non-pull-start versions will be available, which should make this engine popular with racers and enthusiasts alike. Look for a review of the ET-12 in an upcoming issue; if it performs as anticipated, you can expect to see more than a few of the new mills appearing at your local track.

RACER TIP OF THE MONTH

■ The G-Man of Radio Control Car Action



Here's a tip that will help you more accurately adjust the camber on your touring car, pan car, or just about any on-road car, for that matter. First, set up your car with approximately 1.5 degrees of negative camber on all four tires. Next, with a grease pencil or "cellophane" marker, draw a straight line diagonally across the front tires, as shown in the photo. You can also mark the rear tires on all full-suspension cars, but it's not really necessary.

Run your car on the track for a few laps then check out the lines you marked on the tires. If you observe that the line you drew is more faded on the outside, it means the tires are wearing more on the outside than on the

inside, and you should shorten the camber rods slightly. If the line is fading more on the inside, lengthen the rods slightly. Once you have the camber properly set, rotate the left and right front tires after every battery pack; you'll find that your tires last twice as long.



RACER news

INNOVATOR AT WORK

Tim Clark

For well over a decade, Pro-Line has manufactured high-performance racing tires used by many top drivers looking for a competitive edge. As a result, Pro-Line has established an impressive resume that's full of national and world-championship titles, but Pro-Line tires are also popular with sedan racers, monster-truck fanatics and everyday R/C enthusiasts who appreciate the company's reputation for high quality and cutting-edge innovations. This month, we talk to Pro-Line's master tool/mold maker and resident engineer, Tim Clark.

R/C Car Action: You're always busy creating the tooling that's necessary to design the tire molds, and you're responsible for coming up with many of the new tire concepts. Where does your inspiration come from?

Tim Clark: I would have to say that when I first started at Pro-Line in 1989, good ideas were probably harder to come by, but over the last ten years, I have spent countless days observing the performance of R/C car tires at major events. It is at these events where I get my inspiration, and I get those "If only I had a tire with ..." ideas. For the future, I've enlisted the help of Jason Ruona, who is an accomplished racer and well in tune with what other racers need. Jason's help allows me to focus more on managing our tool room and developing improved manufacturing techniques.

RCCA: I know that racer input is of prime importance to Pro-Line. How much influence do the Pro-Line team drivers have on the design of new tires?

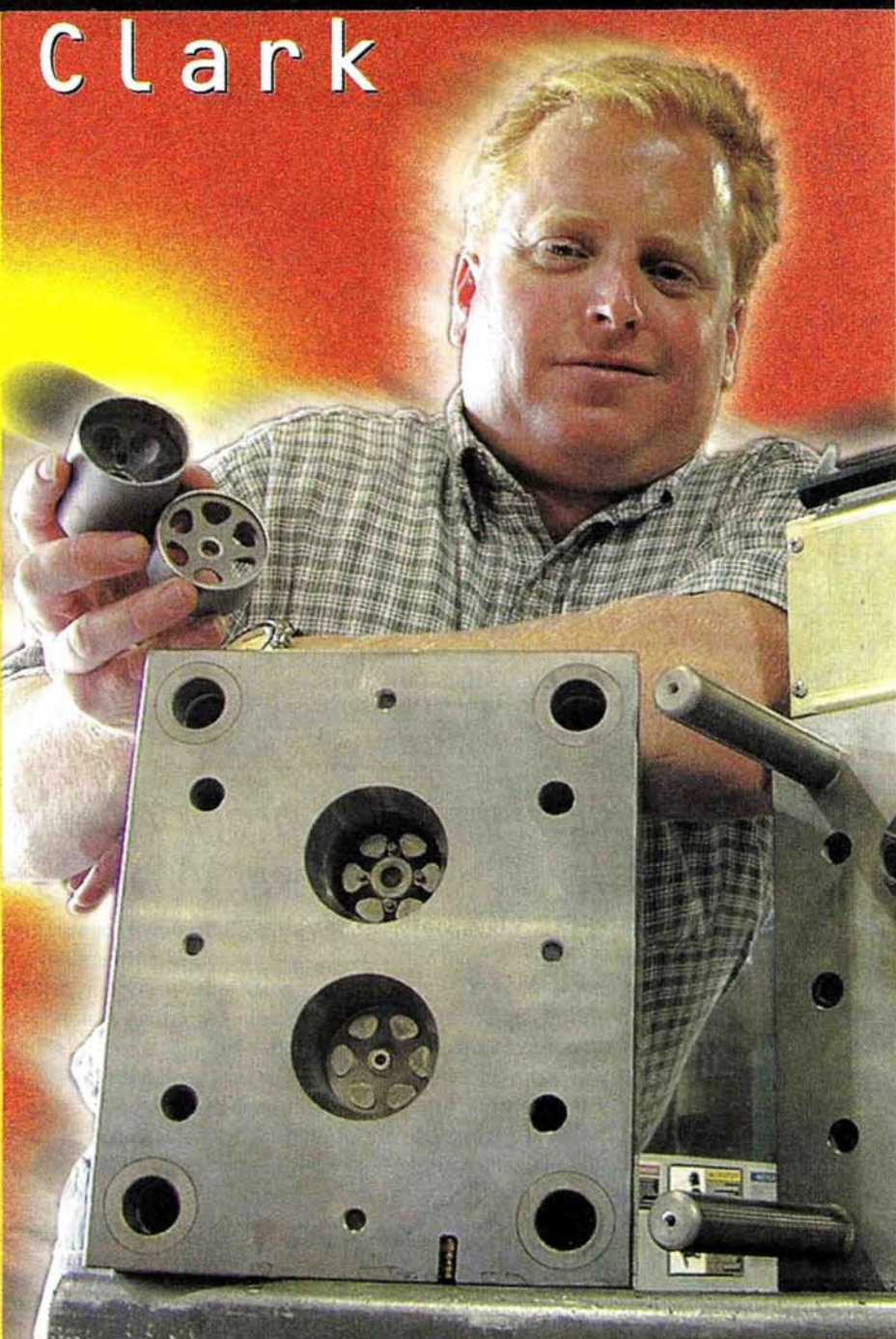
TC: Our racers give us a great deal of input; however, it is usually focused more on how current or new tires are performing or not performing in specific conditions. I would have to say that most of our best tire designs have been developed in-house and have been a surprise to our own racers.

RCCA: Perhaps you can shed some light on how new products are developed at Pro-Line. Could you take us through the various stages, from concept to production?

TC: Conception of a new product begins with input from consumers, dealers, racers, or simply from our own observations of what our product line is missing. Different members of our team will then formulate opinions

about what we need to do next, and we meet to throw all the new ideas out on the table and discuss their validity. We then assign "the keepers" an order of importance and a due date. After our development list has been completed, we finalize parts drawings and reverse engineer mold drawings; all of this

takes place using state-of-the-art CAD/CAM software. At this point, we go to work in the tool room, where we have CNC equipment that's capable of creating the highest quality mold components. Once the molds have been completed, they are sent to the Production department to be tested. As each product is





returned to Engineering, it is inspected for the correct dimensions and then performance-tested—usually by a member of our race team. Once the product has been approved through testing, it is given a release date and scheduled for actual production.

RCCA: Thanks for that “in a nutshell” explanation. Now tell me, is off-road rubber still the biggest seller at Pro-Line, or have touring-car tires taken over?

TC: Our off-road line is still very successful, and it makes up the bulk of our sales, but at the same time, our touring-car product line is growing the fastest. We are committed to taking this segment of our business to the same level as off-road.

RCCA: I just realized that your initials also stand for “touring car.” Hmm; could this be some kind of an omen?

TC: Well, I’d have to say that it’s a good omen. The touring-car market has been good to Pro-Line.

RCCA: Are you working on any new projects that you find particularly exciting?

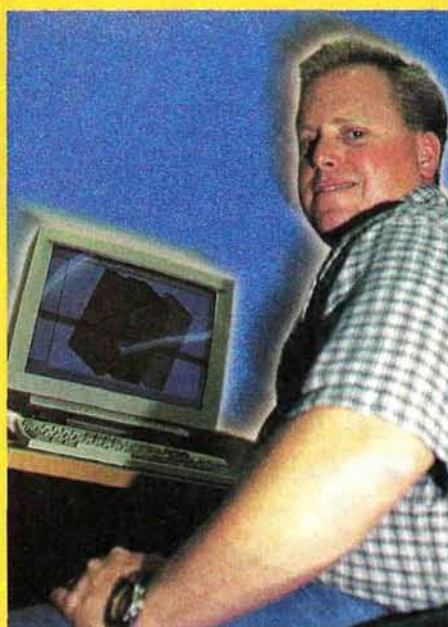
TC: It seems that we have an endless list of new projects for race and play. They all look exciting to me.

RCCA: Pro-Line has developed pneumatic slick tires for static model dragsters and funny cars, and the company is also developing wheels for other static models. Can you tell us a little bit about this venture?

TC: Sure! We realized that there is a need for high-quality wheels and tires for static modelers. We have just completed molds for top fuel dragster rear tires and wheels. The tires have a much more realistic profile than those currently available, and the tires are molded in a soft compound that allows the sidewall to flex. The wheels are a very realistic representation of the famous Weld wheel, with gold centers and electroplated outer rings. We are currently working on matching wheels and tires for the fronts of top fuel and funny cars. These new products will be marketed by a new division of Pro-Line called SO-REAL products.

RCCA: Sounds pretty cool! If you guys mold the static model tires in Pro-Line’s sticky S3 compound, modelers will be able to display their models by sticking them to a wall. Let’s change gears and talk about you; what type of business were you in before you joined Pro-Line?

TC: Before I started with Pro-Line, I worked for a factory-backed, off-road racing team called Walker Evans Racing. Walker had backing from Dodge and Jeep for racing trucks in both the



Welcome to Tim’s world. Before any machine work is done, all the tooling exists only in cyberspace and Tim’s imagination.

desert and in stadiums, which required us to travel all over the country. I was one of the top fabricators and was involved with the design and fabrication of the racecars from the ground up. I still love the craft of metal fabrication and have a fully outfitted garage with welders and a tube bender at home. I look forward to using these skills whenever possible at Pro-Line.

RCCA: How did you first become exposed to R/C cars, and what made you decide to join forces with Pro-Line?

TC: I had been involved with off-road racing for a long time when I met Joe Warren, the founder of Pro-Line, through a mutual friend. Once when I returned from a six-week road trip, there was a message from Joe on my phone; he asked if I would consider coming to work for him. Joe explained that he had just returned from the Australian Worlds, and that things had not gone well at all. He was impressed with my accomplishments and was convinced I could turn Pro-Line’s race program around. I was at a point in my career where I was looking for new experiences, and I also knew that I would have no problem returning to full-size racing in the future, so I took the job. As far as R/C experience, the only exposure I had before Pro-Line was a Cox Scorpion that I bought and ran only a few times. Oddly enough, all I remember is that

the tires kept falling off.

RCCA: Ironical, huh? So what do you like to do when you’re not working? Are you involved in any other hobbies or sports?

TC: As you know, I still love full-size racing. For the last three years, I have raced in a NASCAR series called Spec Truck. This class consists of a twenty-five-hundred-pound tube frame truck with a three-hundred-horsepower motor limit. The series races on asphalt oval tracks in southern California. Last year, I finished fifth in the series and have already racked up three top-five finishes this year. I also like to ride dirt bikes. I used to race motocross in high school and currently have a YZ 400 and belong to a motorcycle club. I still like to ride motocross. Just this year, I competed in a six-hour team race at Glen Helen and a one hundred fifty-mile desert race in Laughlin, Nevada. In addition, my wife, Melanie, and I like to go boating on the Colorado River as much as possible during the summer. We are both novice wake boarders but have dreams of pulling off some big air.

RCCA: What is your most memorable experience while working at Pro-Line?

TC: That’s a tough one. It could be the time Team Associated had nine out of ten qualifiers in both car and truck mains at the Florida Winter Champs using Pro-Line tires. Then there was the time Todd Matson and I went to the worlds in Japan with only one box of twenty pairs of the brand-new Square Fuzzie. We thought the odds were against us, but we ended up having Matt Francis, then an Associated/Pro-Line driver, and Mark Pavidis win using our tires. But probably the most exciting time for me was watching Brian Kinwald win his first world championship in England using Pro-Line tires on his Team Associated RC10.

RCCA: I’ve heard rumors that there are plans to build an on- and off-road track behind the Pro-Line building. Is this true? If so, when can we race there?

TC: Let’s put it this way: the plans are drawn. They show two, seventy-five by one-hundred-twenty-foot racetracks—one asphalt and the other dirt—right behind our building. I am just waiting for the official thumbs-up from the boss, and we could be racing by November. How does the Pro-Line Thanksgiving Classic sound?

RCCA: Sounds great to me! Thanks for the interview, Tim, and good luck with your career at Pro-Line. Keep making those cool tire designs.



RACER news

Speed Shop

Trinity "Watt Bars" and Rebuildable Spec Motor

Check out these super-low-resistance battery bars from Trinity*. They're constructed of 100-percent copper for low-loss power transfer and are uniquely shaped to facilitate soldering and to protect the cells' heat-shrink from being damaged.

The stamped-in positive and negative signs allow the solder to flow under the bar and help you avoid incorrect assembly. For the ultimate in low resistance, try the silver-plated Watt Bars—the perfect choice for the big-dollar set of "A-main" cells.

Also new from Trinity is its Rebuildable Spec Motor that's Street-Spec legal. The new Spec motor features a 21-turn armature that's wound with 21AWG wire and is fixed at 12 degrees of timing—the same specifications as the non-rebuild-



able version. The motor also features Street Spec-legal brushes and springs, and the armature is stamped with an easy-to-read (and tech) S-Spec label. Like Trinity's other rebuildable electric motors, it has a slightly longer motor shaft. Now Street Spec racers will be able to rebuild their motors, and that will further reduce the cost of racing in the Street Spec series.

Package of 7 Watt Bars—part nos. RC5106 (copper), \$2.99; RC5107 (silver-plated); \$3.99.

Rebuildable Spec Motor—SS2226, price NA.



Beat X Specialty Parts from Kawada

Kawada* has a few new widgets that are worthy of your consideration. First is the company's alloy washers for both flat-head screws and cap screws. The flat-head alloy washers are beveled to allow flat-head screws to fully seat into the washer, and the alloy washer provides a slightly larger surface area for greater mounting security. The caphead alloy washers also feature a larger mounting area, and both types of washers have a natural aluminum finish.



Also new from Beat X are its "Multilam," 24-karat-gold, super-low-loss battery connectors. Using these connectors is the next best thing to hard-wiring your electronics, and it's much more convenient. The package includes two male connectors that must be soldered to the positive and negative leads of your ESC and 10 female connectors that allow you to solder as many as five battery packs. The male connectors have a spiral twist that helps clean the connectors every time a new battery pack is installed.

Beat X alloy washers—part nos. B-15 (for flat-head screws) and B-16 (for cap screws); \$4.95. Beat X Multilam battery connectors—B-08, \$10.95.



Tamiya TG10 Chassis Hop-ups from Cross Racing Equipment

Cross Racing Equipment* has just released several alloy parts for the popular Tamiya* TG10 that are designed to increase strength and give your car that polished, all-business look that racers crave. Featured here is the company's new, machined-aluminum-alloy chassis that's lighter than the stock chassis plate. The chassis plate features countersunk screw holes that give the TG10 a perfectly smooth underbelly. In addition, the motor-mounting screw holes are recessed and slotted to keep the engine-mounting screws from protruding from the bottom of the chassis and to allow some room to make spur-gear and clutch-bell changes. Every bit of excess material has been machined away to make the chassis as light as possible without sacrificing strength, and the cutouts provide additional cooling.

Cross has also released a very cool-looking graphite upper deck that will shave a large chunk of weight from the overall chassis. You might also consider the company's new aluminum-alloy engine mounts that have been machined to reduce weight and are finned to help dissipate heat. Unfortunately, we don't have a sample of the upper deck and engine mounts to show you, but trust me, these items rock!

TG10 aluminum-alloy chassis—part no. TZ-19GP, \$79.99; graphite upper deck—TZ-08GP, \$61.99; aluminum motor mount—TZ-120GP, \$16.99.





RACER news

RACER PROFILE

Ryan and Kirby Hand

VITAL SIGNS

RYAN HAND

Age: 23
Hometown: Tower City, PA
Occupation: TRC production supervisor
Years racing: 9
First R/C car: R&D Terminator
Favorite racing class: 1/10 mod oval
Favorite track: King Superspeedway

KIRBY HAND

Age: 21
Hometown: Tower City, PA
Occupation: Motor production technician
Years racing: 9
First R/C car: R&D Terminator
Favorite racing class: 1/10 mod oval
Favorite track: King Superspeedway

Both sponsored by: Trinity, TRC, Novak, Futaba, Bolink, Lunsford and MIP



You may recall that we profiled Daryl and Duane Silva, the not-so-identical twin brothers who race for Team Associated, in an earlier installment of "Racer News." This month, we're featuring Kirby and Ryan Hand, brothers who are a driver/mechanic team like the Silvas. Kirby and Ryan are part of the Team Trinity oval-racing camp, though. Both of these driver/mechanic teams are highly respected in oval racing, and both have been called "the dynamic duo" of oval racing. Since there can be only *one* "dynamic duo" of oval racing, we're going to have to think of a way to decide which team it is. Here are Kirby and Ryan.

R/C Car Action: It has been awhile since I've seen you guys; it must be because you're both always hard at work at Trinity's headquarters in New Jersey. What do you guys do at Trinity? What are some of your responsibilities?

Kirby Hand: I work in Trinity's motor department, helping with motor production—welding and epoxy balancing. I also occasionally work in the battery department and have also dabbled in sales. Ryan works in the TRC Tire division and is in charge of running the water jet and supervising the manufacturing of foam tires.

RCCA: You've both been racing R/C cars for quite a while; did one of you get started in the hobby first, or did you both become involved in R/C at the same time?

Ryan Hand: My brother started first, and I got started roughly six months later. Kirby has always been the better driver, so I decided to exploit my technical abilities by wrenching on his cars.

RCCA: I understand; Kirby does the driving, and Ryan does the wrenching. Have you ever reversed roles?

KH: As far as driving is concerned, I don't think we'll ever switch roles. When it comes to wrenching, I'll sometimes work on a backup or a 1/12-scale car while Ryan is busy wrenching on my 1/10-scale car.

RCCA: What kinds of things are being done to make oval racing more fun and cost-efficient?

KH: I think that bringing back four-cell racing in 1/12-scale will spark some interest. The 19-turn class is huge in the Southern regions and gives drivers a cost-effective class that is almost as fast as the open-mod classes. Retaining scale realism is also important to the future of the sport.

RCCA: I get the impression that you guys are best friends. Is this true, or have I only seen one side of the Hand brothers?

RH: We get along when we have to, but we've been known to be at each other's throats from time to time.

RCCA: I've heard other racers refer to you guys as the "dynamic duo" of oval racing, but many people say the same thing about Duane and

Daryl Silva of Team Associated. Would you two be willing to compete against them in a race to determine who gets the title?

RH: Yes, a private race with the Silvas would be fun. We're actually good friends with them, and I'm sure they would dig it, too.

RCCA: If this race was to become a reality, who do you think would win? Before you answer, keep in mind that it would have to be a two-car race—no other cars on the track—and both the driver and mechanic would have to have equal wheel time.

KH: Is it absolutely necessary for Ryan to drive? If so, I'll make sure he only drives during the second half, when the batteries start to go weak!

RCCA: Are you guys big NASCAR fans? If so, who are your favorite drivers, teams, etc.?

KH: I've always liked Bobby Labonte. We're also friends with Tony Stewart, so I'd say my favorite is the Joe Gibbs team with Tony Stewart. Watch out for Stewart because he's going to be the next big NASCAR star.

RCCA: If you guys could have any car (full-size, that is) in the world, which would you choose?

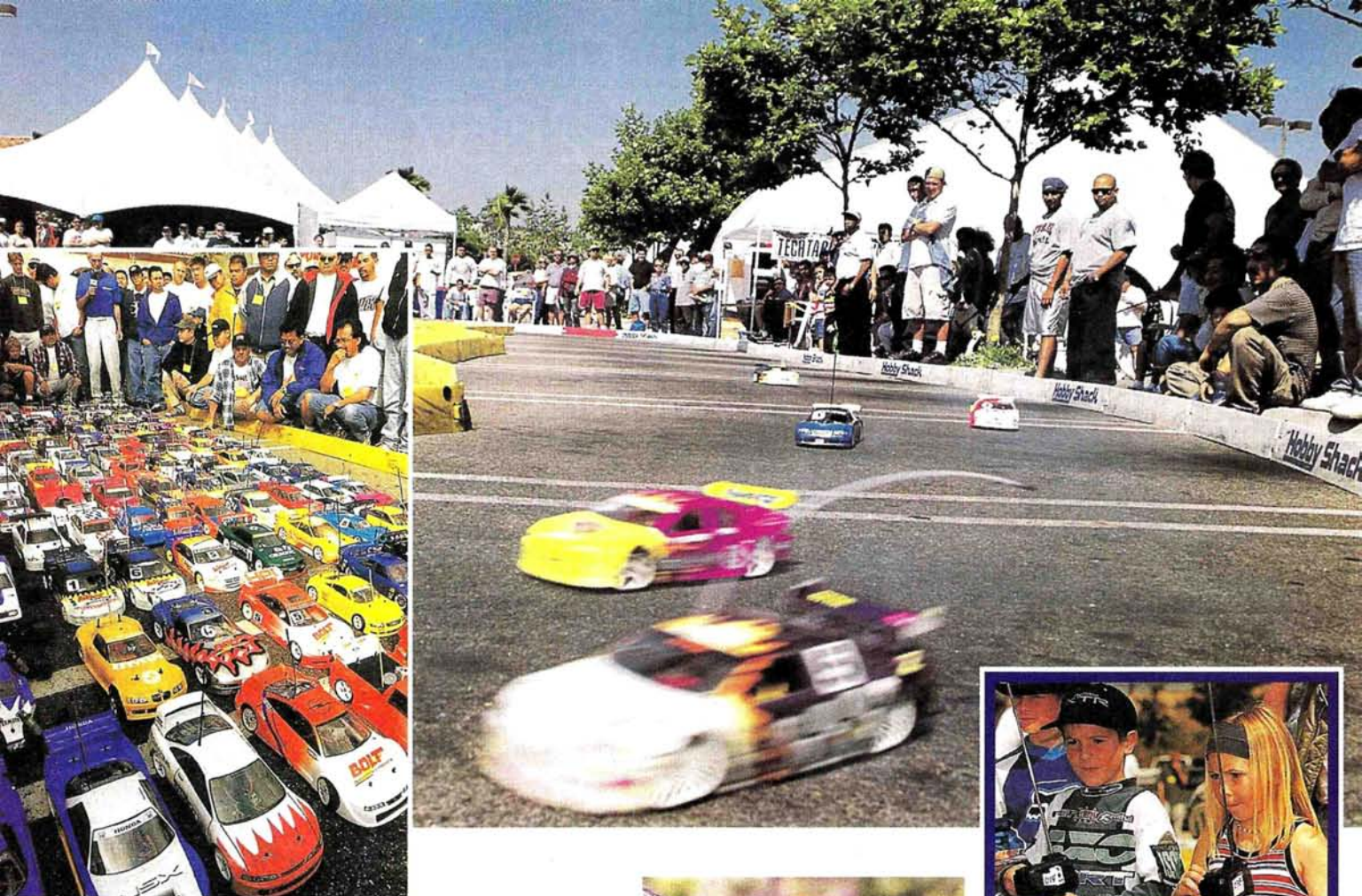
RH: Definitely a Mustang 5.0! Kirby has dreams of owning a McLaren F1 because it's the fastest street-legal car in the world. Leave it to Kirby to shoot for an impossible dream.

RCCA: Do you have any advice for racers and track owners concerning how to make oval racing more affordable for the average, first-time racer?

KH: Street Spec is a great way to start. The cars are affordable, easy to build and maintain and are simple to tune. The class can be very competitive and serves as a great bridge for advancement in the hobby.

RCCA: Thanks for your time, Ryan and Kirby. As always, I wish you guys the best in your future endeavors, and remember: you're going to have to face the Silva brothers at the next big oval race.

**Addresses are listed alphabetically in the Index of Manufacturers on page 209.*



R/C for everyone!

by George M. Gonzalez

Hobby Shack, Southern California's leading hobby retail chain and parking-lot-racing authority, held its Expo '99 at the beautiful, new, Rancho Cucamonga megastore, and racers had a rare opportunity to compete in front of thousands of spectators. Hobby Shack's "Blue Crew" made sure that the racing was organized and enjoyable, and many R/C factory representatives were on hand to answer questions about R/C racing and other family-oriented hobbies.



Traxxas, Tamiya, HPI, Trinity, Pro-Line, Hitec RCD, Peak Performance, Team Associated, Team Losi, Airtronics, Novak and many others—as well as several non-R/C companies—set up booths beneath a large tent; every 30 minutes, one of the aforementioned companies would conduct a seminar on subjects ranging from "How to get started in R/C" to "Advanced driving techniques" and "Computer-operated radio setup." Hobby Shack even held hourly drawings for complete R/C setups and other valuable items such as ESCs, transmitters, motors, Lexan bodies, R/C apparel and more.

Oh, and by the way, senior editor Chris Chianelli was also there, so if you'd like to see Hobby Shack Expo '99 through the eyes of a madman, turn to "Chris's Back Lot."



TRAXXAS' "TRY ME TRACK"

Traxxas once again sponsored the "Try Me Track," and it was one of the most popular attractions, as evidenced by the long lines continually surrounding the track. The track is basically a small, paved oval that's open to anyone who would like to give R/C racing a try.

Participants were handed a transmitter, and one of the Blue Crew placed Traxxas Rustlers and Stampedes on the track for them to try. The laughs could be heard all over the shopping center because the participants had such a great time chasing one another down and jumping the trucks over obstacles.

Although the Try Me Track was overrun by youngsters, an adult would occasionally show up to see if he or she could uncover some hidden R/C'ing talent—only to be smoked by a tyke!

HOBBY SHACK



WORLD CHAMPIONSHIP ADVICE



Tamiya brought along a couple of TRF 414X prototype sedans, and there was a lot of oohing and aahing.



On-road World Champ David Spashett flew in from Great Britain to staff the Trinity booth.



Novak's Tyree Phillips was on hand to field all types of ESC questions.



World champion Mark Pavidis, along with oval aficionadoes Daryl and Duane Silva, passed along a lot of R/C racing advice.

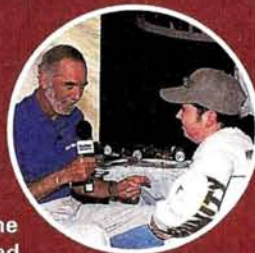
Every half hour, a representative from an R/C manufacturing company would take the podium and give a brief presentation on an R/C topic.

Ralph Jerome of Traxxas discussed the differences between on-road and off-road racing and helped people decide whether to go gas or electric, unassembled kit or RTR.

Team Associated drivers Mark Pavidis and Daryl and Duane Silva provided on- and off-road driving tips.

Tyree Phillips of Novak educated large groups on ESC basics and explained the benefits of programmable ESCs.

These were some of the seminars; all the manufacturers were given equal "airtime."



FUN AND EXCITING RACING FOR ALL

A Hobby Shack Expo wouldn't be complete without R/C racing, so many types of parking-lot racing were part of it. Racing classes were offered for all types of vehicles, including sedans (electric and gas), F1s, M-chassis, mini 4WD (electric and gas), direct drive, gearbox and many more.

There was a class for every type of vehicle—not surprising, considering the company's "race what you bring" philosophy. In addition, there were classes for stock and modified cars, expert and rookie drivers—thus, the event attracted racers of all levels.

Many factory teams and sponsored drivers also competed, and that gave average racers the chance to race fender-to-fender with the likes of Brian Kinwald, Mark Pavidis, Jason Ruona, David Spashett and Tyree Phillips (to name just a few).

Hobby Shack offers one of the most successful racing programs in the nation, and it was great to see a company with so much experience introduce the hobby to thousands of spectators. Most of Hobby Shack's weekend parking-lot races are held in crowded shopping centers; this means that tens of thousands of people are exposed to the R/C car hobby every year. Thank you, Hobby Shack!

FINAL THOUGHTS

The Hobby Shack Expo '99 was extremely successful, and I'm sure that many people were introduced to the hobby by being there. Just think: if only 10 percent of the people who attended it went out and bought an R/C package for the first time, 500 newcomers would now be looking for a place to race. Be sure to welcome new racers to your track; they're our hobby's future. ■

EXPO '99

by Peter Vieira

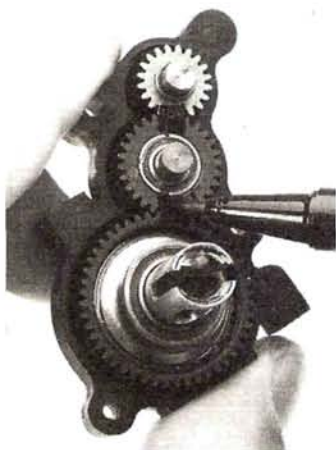
Simple steps to a trouble-free tranny

This one's for all you Veg-O-Matic pilots out there. You know who you are; as everyone else's car sings down the back straight with only the whisper of the tires on the dirt and the occasional slipper-clutch hiss, your rig churns across the track, shrieking like a worn-out electric pencil sharpener. If the sheer embarrassment of driving that ear-sore isn't enough to get you to tear down the tranny, consider this: the noise you hear is the sound of parts wearing out—quickly! Also, it takes energy to make all that noise—energy that could be helping your car or truck go faster. Thankfully, it's not difficult to get those gears back up to spec. Here's how to troubleshoot your tranny and get the smooth back into your gearbox.

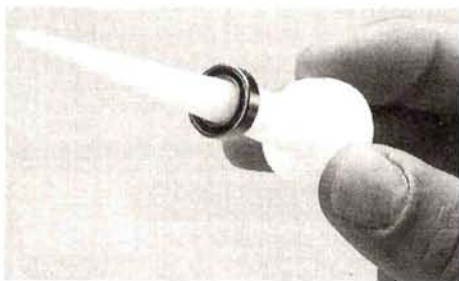
DISASSEMBLY

Remove the transmission from the vehicle, and brush off any caked-on dirt or other crud to avoid contaminating the inside of the gearbox. Once clean, remove the spur gear/slipper clutch to make it easier to disassemble the rest of the gearbox. After noting which diff outdrive houses the adjusting screw, open the gearbox, but take care to keep all the gears in one half of the transmission housing. If you plan to reuse the internal gears, take a moment to mark them with a permanent-ink pen as shown in the photo. It's a good idea to reinstall the gears in the same position as they were in when they were removed, because the gears wear as a set, and any repositioning could cause accelerated wear. The marks will allow you to reinstall the gears precisely.

Remove the gears and clean them with denatured alcohol; be careful not to wipe off the gear-indexing marks you just made. Wipe off the diff gear as well, then set the diff aside. Pop



Mark the gears as shown so you'll be able to reinstall them exactly where they came from.



This tool from Performance Hobby is invaluable for testing bearings. It allows you to hear grit; you would be amazed at how gritty a bearing can be yet still feel smooth when spun on your finger.

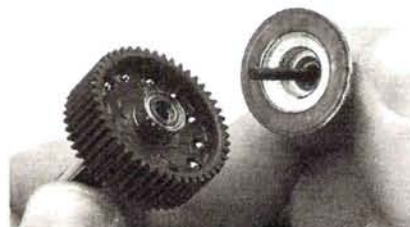
out any pressed-in gearbox bearings, and test them individually for smoothness (Performance Hobby* makes a nice tool for this). If you have a sealed bearing that has gone bad, you may be able to carefully remove the seal and clean it, but when in doubt, replace it. Blast any gritty, non-sealed bearings with motor spray and a bearing cleaner

(Robinson* and RPM* make good ones), relube, and retest until smooth. If a couple of runs through the bearing cleaner can't save the bearing, junk it.

DIFFERENTIAL REBUILD

This is the heart of a transmission rebuild. To be honest, the diff is usually the sole reason anyone disassembles the tranny; the rest of the transmission "rebuild" is only done because the whole assembly happens to be apart.

1 Remove the pressed-in, adjusting screw cover (if your diff uses one) from its outdrive, and back out the adjusting screw or bolt beneath it, but don't remove it from the outdrive. Carefully separate the diff halves from the diff gear, and remove any bearings that are pressed into the diff gear or diff halves. Give the bearings the same treatment as described for the gearbox bearings, then reinstall the bearings.



Watch for falling diff balls! Work over a towel, just in case.



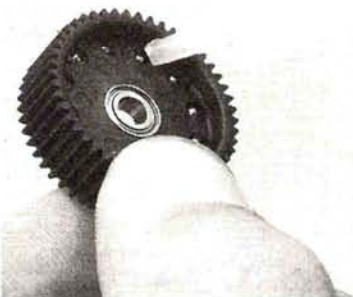
Poke the diff balls out of the diff gear, and if your diff is equipped with a center bearing, remove it.

2 Place the diff gear on a towel, and pop out any diff balls that haven't fallen out (it's a good idea to do this over a towel so the balls don't roll away). Clean the gear with plastic-safe motor spray, and use a pipe cleaner to wipe out the diff-ball holes. The diff balls can be cleaned and reused if the diff was smooth before you took it apart, but if the diff felt gritty, rough, or notchy, then you should junk the balls.

3 Using a clean, 1/16-inch Allen wrench or a similar tool, smear diff lube inside each diff-ball hole, then insert the balls and apply a small dot of lube onto the exposed sides of the balls. In this case, I'm replacing the worn-out originals with Acer Racing* hard tungsten balls and applying Associated's* Stealth lube. Set the diff gear aside.



Use a hex wrench to spread diff lube around the diff-ball holes. You don't need a ton of it—just enough to coat the inside of the holes.



Before you reassemble the diff, place a tiny dab of diff lube on the exposed areas of each ball.

side has a barely discernible bevel that—if you can spot it—should be installed facing the diff gear. If you can't see a difference, don't sweat it. Install the flipped or new rings on the outdrives with a spot of grease as adhesive.

5 Working over the towel, remove the diff-adjusting screw and thrust bearing from the outdrive. The thrust bearing (which is usually a pair of washers and some tiny balls, but may be a "one-piece," caged bearing) may come out with the screw intact, fall apart on the way out, or remain stuck in the outdrive. No matter what



This is the thrust bearing—exactly as it came from the diff. Looks pretty nasty! The tiny balls are easy to lose, so be careful when you remove the bearing from the outdrive.

thrust bearing. Replacing the nut is cheap insurance against a loose diff.

6 Time to reassemble the diff, starting with the thrust bearing. Place a thrust washer over the diff screw, then apply a thick bead of thrust-bearing lube (I use Associated black grease; never use silicone grease or diff grease). Using a $\frac{3}{16}$ -inch, non-magnetic



Smear a thick layer of grease on the thrust washer to hold the balls as you build.

4 Remove the diff rings from the outdrives, and wipe them off. Carefully inspect the diff-ball path, which should appear as a polished band. Drag your fingernail across the path; you should not be able to feel it. Likewise, you should not see any visible scratches or gouges. If you do, or if you can feel the wear on the diff rings, you can salvage them by flipping them over. If you've already flipped the rings and now both sides are worn out, you'll need to replace them. When installing the new parts, carefully inspect the profile of each ring; one



Inspect the diff rings before you reinstall them. This is normal wear: the ball path has been polished, not gouged.

the scenario, be sure to check that none of the itty-bitty thrust balls are stuck in the outdrive. Once you're certain you have collected all the thrust-bearing parts, clean them thoroughly, and check the thrust washers for wear in the form of gouges or grooves. If the diff felt gritty before disassembly but the diff rings did not show excessive wear, it's highly likely that the thrust bearing is the source of your trouble. When in doubt, replace the thrust-bearing assembly. Also worth replacing is the diff nut found in the outdrive opposite the one that housed the

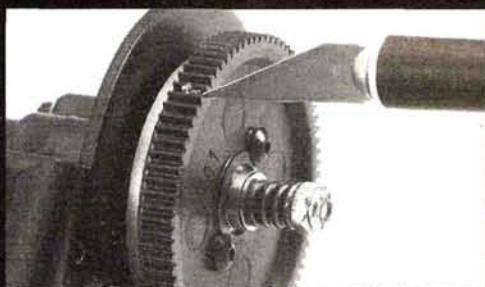


Like diff rings, thrust washers should be carefully inspected for wear. Although visibly worn, these washers can be reused simply by being flipped over.

Allen key with a bit of black grease on the end for grip, carefully place each of the thrust balls around the screw. Next, slide the remaining thrust washer over the bearings, making what looks like a ball-bearing hamburger. Smear black grease around the exposed sides of the balls, taking care not to pull any out with the sticky grease.

7 Carefully slide the diff screw and thrust bearing into the outdrive, and place the new diff nut into the opposite outdrive. Place the diff gear over the diff half with the adjusting screw, place the other diff half in position on the diff gear, and tighten the screw.

DO YOU REALLY NEED A REBUILD?



Crunch! This little stone might as well be a boulder. The spur gear will be safe to use once the stone has been plucked out, but the pinion has been nicked and will chew the spur into uselessness if left as is.

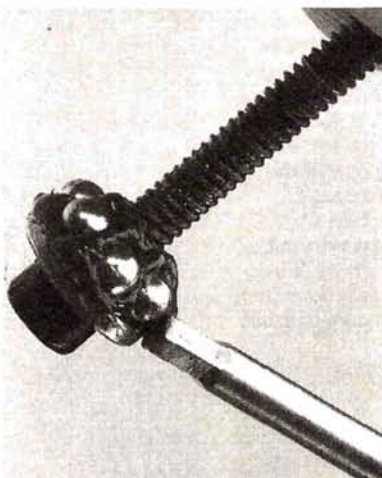
Obviously, funny noises are always a good indication that a rebuild is required. However, a noisy gearbox usually means you've encountered significant damage or wear. Preventive maintenance is key; all you really need to do is to inspect your gearbox frequently. Here's what to check:

■ **PINION AND SPUR GEAR.** Check for any obvious signs of damage, such as nicks or missing teeth. If you find either, replace both gears; a bad pinion will chew up a good spur gear, and vice versa. If the gears seem all right, remove the rear wheels and blip the throttle. Does the pinion/spur mesh sound smooth, or is there a clicking sound? If you hear a clicking, a tiny bit of grit has become trapped in the teeth of the pinion or spur. If it's so small that it hasn't damaged the gears, then you may have a tough time locating such a tiny bit of debris, but trust me; it's in there. Look in the valleys between all the gear teeth until you find the culprit, then pick it out with a hobby knife. Blip the throttle again; the clicking should be gone.

■ **DIFFERENTIAL.** Remove the rear wheels and turn one of the stub axles with your fingers (if you don't have a pinion or motor installed, hold the spur gear so it doesn't turn). The diff should operate smoothly without a gritty feel, tight spots, or "lumps." If you feel anything less than buttery-smooth diff action, your diff is due for a rebuild, and that means the whole tranny has to come apart. Note: if you suspect your universals or dogbones may be gritty in their own right, remove them and turn the diff outdrives directly.

■ **TOP SHAFT AND IDLER GEARS.** If the pinion, spur gear and diff pass muster, remove the pinion and spin the spur gear. The transmission should freewheel easily without clicking, sounding gritty, or making metal-on-metal chirping sounds. As the top shaft spins, watch for runout (wobble) in the shaft or spur gear. Anything more than the slightest runout is too much. If you've discovered no weird sounds or other problems during all three tests, you can skip the tranny rebuild.

8 To adjust the diff, tighten the diff screw until it just bottoms out, then back it off $\frac{1}{8}$ turn (this is the official factory setting for Associated vehicles, but it's very close for just about any ball-diff-equipped car). Work the diff to check for smooth action and help the parts seat fully. If everything seems satisfactory, check the diff setting by placing a screwdriver blade or Allen wrench into each outdrive slot to lock them in place, then try to turn the diff gear. It should be very difficult (if not impossible) to move yet still turn smoothly when the diff operates.



Above: use the tip of a hex wrench to press the thrust balls into the grease.



Above: slide the remaining thrust washer into place, then coat the outside of the diff balls with grease.

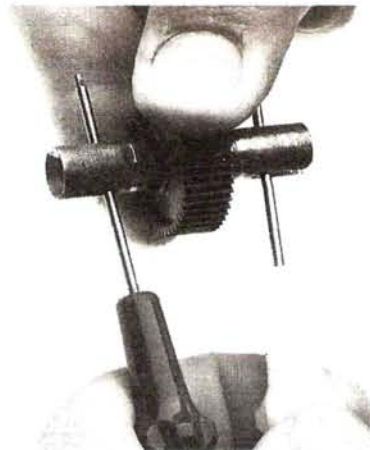
REASSEMBLY

Getting the gearbox back together is simple; just reverse what you did before. If you can't remember where certain bits of hardware go, your kit's manual is an invaluable resource (you saved it, right?). Remember to align the gears with the marks you made, and be sure to install the diff so the adjusting screw is on the correct side. If you run in dry, dusty conditions, apply a little grease to the seam where the gearbox halves meet to act as a seal (wipe off any excess once the halves have been assembled).



Left: reassemble the diff, tighten the diff screw until it just bottoms out, then back it off $\frac{1}{8}$ turn. Rotate the outdrives to check the diff for smoothness of operation.

Right: to test the diff setting, lock the outdrives with a pair of screwdrivers or hex wrenches. The diff gear should be very difficult, if not impossible, to turn.



Left: now you can reassemble the gearbox. Be sure the diff is installed with the adjusting screw on the correct side of the tranny (Associated cars have it on the right; Losi diffs are installed with the screw on the left to facilitate external adjustment).

WHEN DO I DO IT ALL AGAIN?

Barring any unusual difficulties and assuming you aren't a national-caliber racer, you should be able to get through a month of racing without pulling the tranny apart. Some guys will proudly tell you that they haven't seen the inside of their tranny all year! You might not want to go that far, but with a little preventive maintenance and respect for your gear, it's not unheard of. Have fun.

WHAT ABOUT MY GEAR DIFFERENTIAL?

It's easy to maintain your grease-filled gear diff; all you have to do is ... *nothing*. If you like to work on your car simply for the sake of working on your car (guilty as charged!), feel free to rebuild it with fresh lube as often as you like.

Start by removing the screws that hold the two diff halves together. When the two are separated, inspect the color of the grease. If you originally built the diff with clear grease and it is now black, it's time for some cleaning. The grease turns black as the gears wear and metal particles mix with the lube. Remove all of the gears and spray them down with motor spray or denatured alcohol; while you're at it, spray the insides of the diff halves. Then slide the gears back into the halves the way you found them and coat them liberally with grease. Place the two halves together, reinstall the screws, and you've finished. It's as easy as that.

Silicone diffs should be cleaned in a similar fashion, although they usually use rubber O-ring seals that can be damaged by most harsh cleaners. Remove the O-rings and spray everything using the aforementioned technique. Gently wipe off the O-rings with a towel before placing them back into the diff.

In general, I've seen very few gear diffs go bad. Even when I put bits of a plastic parts tree into a gear diff in a hack attempt to lock it up (don't ask why), it took only a few minutes of running for the diff to chew up the plastic and pack it into the spaces around the diff gears. The diff spun as though I had never touched it!

**Addresses are listed alphabetically in the Index of Manufacturers on page 209. ■*

JR RACING

XR-3 radio set

Cost-effective competitor

One of the most welcome R/C trends of the latter half of the '90s was the increasing interest in "budget" FM radios. There was once a chasm between the cost and adjustability of AM (amplitude modulation) sets and FM (frequency modulation) systems, but now, a number of radios combine the superior control of FM with many of the "second tier" functions usually reserved for big-dollar transmitters. JR Racing's* take on budget-friendly FM is the XR-3—an upgraded version of the popular XR-2. Let's check it out.

FEATURES

- **3-model memory.** The XR-3 goes the extra mile by allowing a name to be assigned to each model. Although only three alpha-numeric characters can be used, it sure beats having each model represented as a mere 1, 2, or 3.
- **3-channel capability.** A three-position switch ("grip dial A") operates the third channel. The three modes are:
 - linear, which will move the servo left and right in any increment you wish within a specified travel range (good for onboard fuel-mixture systems, articulated wings, etc.);
 - 3P, which moves the servo between three preset positions (useful as a gear-shift function in multi-speed Tamiya vehicles);
 - o, which is "off." This setting switches grip-dial A from third-channel operation to brake endpoint adjustment.
- **Direct trim mode.** This is a great feature. Instead of requiring you to scroll through screens to see where trim adjustments are, the XR-3 automatically displays the value of the trim function you are operating. After the adjustment has been made, the display returns to the previously selected screen.
- **Full endpoint adjustments.** Left steering throw, right steering throw, forward throttle and brake/reverse throttle adjustments can be set independently. Very handy.
- **Low-battery alarm.** When the transmitter batteries get low, the XR-3 beeps to let you know; with my luck, this usually happens during my Main.
- **Steering rate.** This function adjusts maximum left and right steering travel. Unlike an endpoint adjustment, which allows left and right throw to be adjusted independently, this function adjusts left and right steering travel simultaneously, and by the same amount.
- **Steering dual rate.** Another must-have feature, dual rate adjusts how much steering travel you have in both directions without affecting the neutral position. The XR-3



shows dual-rate throw as a percentage of total travel as selected via the steering-rate adjustment screen.

• **Subtrim.** This permits the servos' neutral position to be finely adjusted without altering the primary trim adjustment.

• **Receiver and servos.** The XR-3 includes two Z250 Standard Race servos and a 3-channel R133 receiver. A 4-cell battery box, switch harness and servo-mounting grommets are also included.

• **Other stuff.** A "data-reset" function will clear all the settings of a selected model; servo-reversing is easily accomplished through the membrane keypad, which is impervious to dust and moisture; wheel tension is adjustable; and a charging jack is provided for use with a Ni-Cd pack (charger and Ni-Cds not included).

PROGRAMMING THE XR-3

The XR-3 is easy to set up. Simply press "mode" to select the function you wish to adjust, press "channel" to toggle between throttle, steering and third channels, then hit the "+" (plus) or "-" (minus) keys to adjust the value. Alternatively, you can adjust brake endpoint, steering trim, throttle trim and dual rate simply by touching the appropriate trim button; the LCD screen will automatically display the value of the function you are adjusting.

The XR-3's excellent manual will be a great help if you've never programmed a radio before, but racers with computer radio experience will probably be able to figure out the XR-3 with only a glance or two at the instructions.

IN USE

I installed a 27MHz XR-3 in my Associated RC10T3 and tested the radio at a local club race. I had no technical difficulties, and it was easy to dial in the steering rate and trim settings to match the track. The trigger travel feels good, with just the right amount of tension, and the case does not interfere with your finger when you're braking. I did find the XR-3's blocky grip less comfortable than that of my JR R-1, and wheel travel was not quite as smooth. Also, the brake-adjustment-grip dial is too far back to be easily adjusted on the fly. I can adjust it while driving, but it's a bit awkward.

THE VERDICT

Don't let my ergonomic nitpicks trouble you; the XR-3 is a solid, affordable system that is easy to use and program. I would recommend it to any racer, not just those "on a budget." All the features you really need are there, minus the complexity of the everything-but-the-kitchen-sink systems. If you're moving up from an AM system or looking for a second competition radio, give the XR-3 a look. Part no. JRP314127 (27MHz), JRP314175 (75MHz). Suggested street price—\$159.95. —Peter Vieira

LIKES

- Very easy to program.
- Versatile third channel.
- Nice price.
- Includes servos.

DISLIKES

- Blocky grip shape.
- Wheel travel is not as smooth as those on other similar systems.

DURATRAX

Piranha Power Peak Power charger

Nothing fishy here

You know those guys who own every possible high-tech R/C gadget?—the freaks who hog all the pit space with their laptop dynos and satellite Doppler hookups. That ain't me! All I'm looking for in my pit gear is stuff that works well without a lot of fuss, and if it isn't expensive, all the better. DuraTrax's* new Piranha peak charger meets my needs by offering intelligent features and simple operation at a low price. I've been using it for all my pack charging for a few weeks now; here's what I've found:

FEATURES

Once you've plugged the Piranha into a wall outlet or hooked it up to a DC source with the included full-size alligator clips, charging couldn't be easier: just plug your 6- or 7-cell pack into the Piranha and push the button.

The unit will peak-charge 1200 to 2000mAh packs at up to 4.5 amps, and a bright red LED lets you know whether it's in quick-charge, trickle-charge, or shutdown mode. False-peak filters help the charger to complete a full charge reliably, even with older packs, and DuraTrax has engineered in some other neat features to make this charger completely "Bob-proof."

If you hook up its alligator clips reversed, there's reverse-polarity protection on its DC input. If your voltage input exceeds 110 volts in AC mode, there's an in-line, replaceable fuse. Likewise, if your pack's

individual cell voltage exceeds 1.75, or if a peak isn't detected within 45 minutes, the system turns itself off.

An industry-standard JST ("Tamiya") plug is supplied to match the sport packs that will be used by most of the hobbyists the Piranha is marketed toward, and an adapter that matches "old-style" Kyosho packs is included (Kyosho packs over four years old use a male JST connector on the pack instead of a female. The current ones use a female). A set of alligator clips for those of us who hard-wire would have been a nice addition, but these are easy enough to make.

IN USE

The Piranha works as advertised; I haven't had any false peaks, but I did have one wretched pack that *never* peaked. As promised, the Piranha shut down when no peak was detected.

Back-to-back charges didn't faze the Piranha, but a cooling fan is recommended for extended charging sessions (good advice for any charger).

Overall, DuraTrax has a winner here; the Piranha is reliable, convenient, and inexpensive (expect to pay less than the full retail price at most shops).

Part no. DTXP 4000.

LIKES

- Reliable, no-brainer operation.
- AC/DC operation.
- Protected against reverse polarity DC hookup and overcharging.

DISLIKES

- User must install alligator clips to charge packs without connectors.
- Low amp rate when set for 6-cell use.



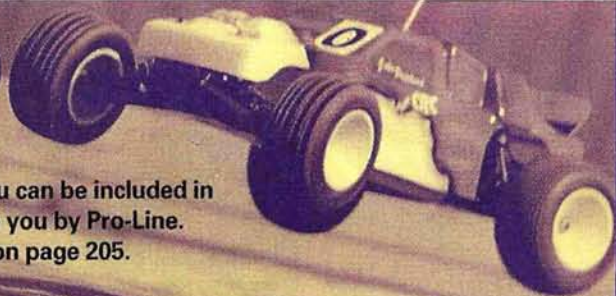
SPEED SECRETS—REVEALED!

AT LAST—the "inside information" R/Cers have been craving is available! The *fastest* "tricks"—**revealed!** Your *toughest* questions—**answered!** By popular demand the **ULTIMATE SPEED SECRETS GUIDE** has been made available for R/Cers who want to know the detailed secrets behind:

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- How to troubleshoot *any* problem!
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- **ADVANCED** racing techniques!
- How to break fewer parts!
- How *everything* on your car works!
- **Much, much more**

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Track Directory

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YOUR 1999 TRACK GUIDE

ALABAMA

Beacon Point RC Raceway, 15717 Beacon Point Dr., Tuscaloosa, AL 35406; Don, (205) 333-8679

Hobbytown USA Raceway, 450-Q Schillinger Rd. N., Mobile, AL 36608; Rob & Karl Baker, (334) 633-8446

Lagoon Park R/C Raceway, 2730 Lagoon Park Dr., Montgomery, AL 36109; Alex Love, (334) 272-6438

Phenix Raceway & Hobby, 2006 Opelika Rd., Phenix City, AL 36867; Chris Watson, (334) 298-9786; <http://www.xoom.com/PhenixHobby>

R/C Hi-Tech Raceway, 3303 Meridian St., Huntsville, AL 35811; Rick Chambers, (205) 539-1347

R/C Thunder Tracks, 1530 Schillinger Rd., Mobile, AL 36675; for mail, use 8125-2 Moffett Rd., Semmes, AL 36575; Jerry Hurst, (334) 645-2787

ALASKA

Fairbanks R/C Car Club, 510 Juneau Ave., Fairbanks, AK 99701; Dan Anderson, (907) 456-5494

ARIZONA

HobbyTown Mountain Raceway, 1500 E. Cedar Ave., Cedar Hills Shopping Center, Flagstaff, AZ 86004; Richard, (520) 214-9887

HobbyTown Raceway, 13802 N. Scottsdale Rd., Scottsdale, AZ 85250; (602) 948-3946

HobbyTown Raceway, 1915 East Baseline Rd., Gilbert, AZ 95234; Dennis, (602) 892-0405

HobbyTown Raceway, 1102 E. 22nd St., Tucson, AZ 85704; (520) 882-8888

HobbyTown U.S.A., 5030 E. Ray Rd., Phoenix, AZ 85044; Linda McFarland, (602) 598-5282

Kiwanis Park R/C Raceway, 855 S. Magnolia Ave., Yuma, AZ 85364; Jim Liggett, (520) 539-7148

Quarter Flash's Squirtn' Dirt Raceway, 16301 S. Santa Rita #C, Sahuarita, AZ 85629; Dave, (520) 625-9274

R/C Sports Mania, 3550 N. 35th Ave., Phoenix, AZ 85017; Brian Dick, (602) 278-3671

Scottsdale R/C Raceway, 3023 N. Scottsdale, Scottsdale, AZ 85251; Scott Anfinson, (602) 945-2186

Speedway Hobbies, 2710 N. Steve's Blvd., Ste. 8, Flagstaff, AZ 86004; Gary McAllister, (520) 714-1566

ARKANSAS

Alison Offroad RC Raceway, 6320 Thibault Rd., Little Rock, AR 72206; Steve or Coop, (501) 490-1227

Arkansas R/C Car Association, 101 W. 52nd St., N. Little Rock, AR 72118; William Byrd, (501) 753-1286

Airport Speedway, 1521 Airport Loop, Rogers, AR 72756; Mike Dollar, (501) 636-7123

Grand Slam Superspeedway, 5300 S. Zero St., Ft. Smith, AR 72901; Bryon Shumate, (501) 648-1994

Hobby Town USA, 356 E. Joyce, Fayetteville, AR 72703; Darrell Irvin, (501) 571-3730

Sparks R.C. Raceway, 7194 Greene 721 Rd., Paragould, AR 72450; Tommy Sparks, (501) 239-3606

CALIFORNIA

California R/C Raceway, 1230 N. Kramar, Anaheim, CA 92806; Taka, Sid, or Charlie, (714) 630-9300

Castle Hobbies, 14918 Camden Ave., San Jose, CA 95124; (408) 377-3771

Desert Hobbies, 28-401 Date Palm Dr., Cathedral City, CA 92234; Mike Beall, (760) 320-9442

Gooch Raceway & Hobbies, 115C N. Chevy Chase Dr., Glendale, CA 91206; Devin Last (818) 562-2380, fax (818) 242-0525

Hobby Central Raceway, 34255 P.C.H., Unit 107, Dana Point, CA 92629; John, (619) 513-0373

Hobby Central II Raceway, 13461 Community Rd., Poway, CA 92064; John, (619) 513-0373

HobbyTown, Parktown Plaza Shopping Center, 1350 S. Park Victoria Dr. #21, Milpitas, CA 95035; (408) 945-6524

Hot Rod Hobbies, 25845 San Fernando Rd., #21, Saugus, CA 91350; Rod Weisbaum, (805) 255-2404

Jake's Performance Hobbies, 6650 Commerce Blvd. #21, Rohnert Park, CA 94928; Jake, (707) 586-3375

Just for Fun R/C Raceway, 509 S. State St., Ukiah, CA 95482; Don, (707) 462-7305

Lucerne Valley Raceway, 32800 Old Woman Springs Rd. #4, P.O. Box 2047, Lucerne Valley, CA 92356; Frank Rodrique, (760) 248-7305

M n M Hobbies, 4225 Prado Rd., Ste. 103, Corona, CA 91720; Joe Stanovich, (909) 272-3545

Nor-Cal Mini-Speedway, 519 Bush St., Woodland, CA 95695; Steve Van Atta, (530) 668-5678

Racer's Haven Raceway, 7401 White Ln. #12, Bakersfield, CA 93309; Martin Buchanan, (805) 835-0441

Radio Control Products, 201 E. Magnolia Blvd. #148, Burbank, CA 91502; Tab, (815) 846-4208

Rams 1/8-scale Gas and 1/10-scale Gas On-Road, Mission College, Lot B, 3000 Mission College Blvd., Santa Clara, CA 95054-1897; Steve Tsuruda, (415) 675-5609

Rattlesnake Raceway, 16470 Benson Rd., Cottonwood, CA 96022; Mel or Mike Fisher, (530) 347-7215, email: RC-geez@webtv.net; website: <http://members.xoom.com/CAR-CORR/Race.html>

Rescue Mini Speedway, 4018 Green Valley Rd., Rescue, CA 95672; Bruce Pease, (530) 621-3948

Ripon R/C Raceway, 701 N. Acacia Ave., Ripon, CA 95366; Dan Tanis, (209) 599-5160

Sacramento RC Racing and Hobbies, 6201 27th St., Sacramento, CA 95824; Andreas Muller, (916) 454-4044

Showtime R/C Speedway, 3709 Abbott Dr., Bakersfield, CA 93312; Grant or Karen Kniffen, (805) 589-0493

Simi Valley Groundpounders, 392 C - East Easy St., Simi Valley, CA 93065; Jack Kasten, (805) 584-8211

So. Cal R/C Raceway, 19118 Brookhurst St., Huntington Beach, CA 92646; Jim Blauvelt, (714) 963-7484

Tri-Valley Auto Racers, Livermore Elks Club, 940 Larkspur, Livermore, CA 94550; Mike Stone, (510) 455-6833

Ultimate Hobbies, 2378 North Orange Mall, Orange, CA 92665; Cliff Murukami, (714) 921-0424

COLORADO

MHOR R/C Raceway, 15540 East Batavia Dr., Aurora, CO 80011; Jess Brockman, (303) 343-0151

Race of Champions R/C Speedway, 300 West 53rd Pl., Unit B, Denver, CO 80216; Dan DeWild, (303) 296-4908

Valley West Off-Road RC Club, 447 30 1/4 Rd., Grand Junction, CO 81504; Waymond Williams, (970) 242-8846

CONNECTICUT

Central CT Auto Racers, Davis Hobbies II, 45A Welles St., Glastonbury, CT 06033; (860) 633-3056

East Lyme R/C Kar Klub, Society Rd., East Lyme, CT 06333; Howard Estorm, (203) 483-9201

K/N R/C Speedway Inc., West St., Stafford Springs, CT 06076; for mail, 44 Clearview Rd., Moodus, CT 06469; (860) 684-9896

Racing and Entertainment Center, 29 Olcott St., Manchester, CT 06040; Peter Tinnelli, (860) 643-4768

R/C Madness, 640 Enfield St., P.O. Box 64, Enfield, CT 06082; Christopher Marcy, (860) 741-6501

Xtreme Radio Control, 469 Danbury Rd., New Milford, CT 06776; Paul or Pete, (860) 354-4703

DELAWARE

The Hobby Outlet: Tracks of the Outlet, Salisbury Rd., Dover, DE 19901; Steve, (302) 697-8350

Hobby Stop Speedway, RD4, Box 100, Rte. 13, Seaford, DE 19973; Remy Haynes Jr., (302) 629-3944

FLORIDA

Broward County R/C Race Club, Mills Pond Park, Ft. Lauderdale, FL; Ed Decembere, (954) 525-3304

Burton's R/C Raceway, 4215 Mustang Rd., Lakeland, FL 33803; Louie Burton, (941) 665-1322

Coral Springs Roadrunners, P.O. Box 9632, Coral Springs, FL 33075; John Argentino, (954) 925-8284

Farmer's Hobby Shop & Raceway, 5006-3 E. Broadway, Tampa, FL 33619; Greg Cardone, (813) 248-3314

First Coast Speedway, 6410 Waltho Dr., Jacksonville, FL 32211; Bob Thompson, (904) 743-2161

Frontier Race Track, 15260 N.E. 244th Ave., Salt Springs, FL 32134; Harold Reel, (352) 685-2881

G & C Hobby Raceway, 1228 Hypoluxo Rd., Lantana, FL 33462; George, (561) 547-3812

Greater Orlando Auto Racers, 970 Keller Rd., Altamonte Springs, FL 32714; Rob Michael, (407) 834-9299

Hobby World Raceway, 7273 103rd St., Jacksonville, FL 32210; Greg, (904) 772-9022

Key to Symbols

- Indoor
- Outdoor
- Off-road
- Oval
- Dirt oval
- Carpet
- Concrete
- Asphalt
- On-site hobby shop
- AC power
- Auto lap-counting
- Food available

Kissimmee R/C Auto Racing, Model Craft World, Osceola Square Mall, 3831 West Vine St., Ste. 60, Kissimmee, FL 34741; John Rosser, (407) 944-4913; email: john@craft-worldflorida.com; website: craft-worldflorida.com

Means R/C Raceway, 150 Pondell Rd., North Fort Myers, FL 33903; Pete Gonzalez, (941) 772-2251; email: jaimewootton@worldatt.net; website: <http://members.xoom.com/wootj>

Monster Hobbies, 616 Southeast 10th St., Deerfield Beach, FL 33441; (954) 428-9118

Morris Kohl's Raceway and Hobby Shop, 1202 W. Waters Ave., Tampa, FL 33604; Morris Kohl, (813) 931-1626

My Rose, 1695 W. Indiantown Rd., Jupiter, FL 33458; Mark Watson, (561) 744-3800

NORRA, 3300 Santa Barbara Blvd., Naples, FL 34104; Dan Rodriguez, (941) 352-9021

Ocala Radio Controlled Car Club, P.O. Box 70166, 2610 SE 8th St., Ocala, FL 34470; Bonita Hansley, (800) 324-8882, ext. 250; email: staff@ORCCC.org; website: www.ORCCC.org

Paradise Speedway, Mile Marker 98.5 U.S. 1, P.O. Box 738, Key Largo, FL 33037; Joe Ravard, (305) 451-3707

Paul's Stadium Raceway, 4511 W. Dr. M.L. King Jr. Blvd., Tampa, FL 33614; Paul Surette, (813) 872-8662

PBG R/C Motor Car, 6351 Barbara St., Palm Beach Gardens, FL 33418; Doug Gleason, (561) 743-9791 or Tim Case, (561) 627-2608

Pro Hobbies Speedway, 715 N. Lake Pleasant Rd., Apopka, FL 32712; (407) 886-4615

Port St. Lucie Racing, 3626 SW Rivera St., Port St. Lucie, FL 34953; Frank Spadavecchia, (561) 336-8711

Randy's RC Raceway, 7744 Glenwood St., Clermont, FL 34711; Randy Zimmer, (352) 242-0557

River City R/C Car Club, 9711 Sharing Cross Dr., Jacksonville, FL 32257; Bill Fraden, (904) 268-1948

Sarasota RC Speedway, 8475 Cooper Creek Blvd., University Park, FL 34201; Jim Wilson, (941) 358-7047

Sea Coast Watercraft and Hobby, 3119 Barrancas Ave., Pensacola, FL 32507; Vic Lakatos, (850) 457-1493

South Daytona R/C Raceway, 2121 S. Ridgewood Ave., South Daytona, FL 32119; Mike Bean, (904) 426-6481

South Palm Beach Racers, South County Regional Park, West Boca Raton, FL 33486; Mike Fazio, (561) 338-5367

Superior Hobbies R/C Parking Lot Racing, 430 E. Hwy. 436, Ste. #106, Casselberry, FL 32707; Rob Michael, (407) 834-9299

Tampa Bay R/C Club, P.O. Box 10224, St. Petersburg, FL 33733; Dick Gillette, (813) 526-0744

Tampa Hobbytown R/C 4 Slot Car Raceway, 15702 N. Dale Mabry, Tampa, FL 33618; Max and Judy Rosenroth, (813) 968-7233

Tropical R/C Raceway, Tropical Park, Miami, FL 33155; Pat Butler, (305) 772-4122

Warehouse Hobbies, U.S. Rt. 27 South, Winterset Motel, Sebring, FL 33872; Tony and Pam Castelronova, (941) 699-1231

GEORGIA

Anthony's Victory Lane, 129 East Hwy. 80, Pooler, GA 31322; Anna Stephens, (912) 748-0847

Bullet Raceway and Hobby, 3735 Old Flowery Branch Rd., Oakwood, GA 30566; Mark Taaffe, (770) 534-9229

Dalton Raceway, 3036 Parquet Rd., Dalton, GA 30720; (706) 226-6699

Echeconnee Superspeedway, 2149 Richardson Dr., Macon, GA 31206; Andy Thompson or Cliff Kline, (912) 788-8731

Emerald City R.C. Speedway, Highway 40 East, East Dublin, GA, 31021; Terry Cook, (912) 272-3856

The Flight Box Hobby Shop, 3134-C Rockmart Rd., S.E., Rome, GA 30161-6826; Leslie Duke, (706)-234-3014

Hobby Town Raceway, 2301 Airport Thruway, Columbus, GA 31904; Frank Bastos, (706) 660-1793

Lake Mayer Raceway, 1430 Dale Dr., Savannah, GA 31406; (912) 598-9709

The Racer's Edge, 1530 Hwy. 19 N., Thomaston, GA 30286; Roger or Mark Walls

Sandy Cross Speedway, Rt. 1, Box 1071, Hwy. 51, Royston, GA 30662; Morris Phillips or Wayne Fowler, (706) 245-9573

Shiloh R/C Raceway, 6362 Shiloh Rd., Hahira, GA 31632; Doug Burnett, (912) 794-2507

Silver Wings Raceway, 5611 Riverdale Rd., College Park, GA 30349; M. Bradshaw, (770) 991-2225

Stinger RC Super Speedway, 3769 Mayville Rd., Commerce, GA 30529; Deric Sauls, (706) 335-5006 or (706) 335-9044

Sugar Bowl R/C Speedway, 5272 Nelson Brogdon Blvd., Sugar Hill, GA 30518; Shelley Bailey, (770) 945-6709

HAWAII

Garden Isle R/C Racers, 5855 Ahakea St., Kapaa, Kauai, HI 96746; Arnold Morales, (808) 823-0856

Kakaako Water Front Park Dragway, 98-029 Hekaha St., Bay #32, Alea, HI 96701; James Inkyo, (808) 487-5155

Mauui R/C Racing Association, 230 Hana Hwy., Unit 11, Kahului, HI 96732; Garret or John, (808) 873-0376, (808) 893-0116, or (888) 646-6687

Pearl City Raceway, 98-029 Hekaha St., Bay 32, Alea, HI 96701; James Inkyo, (808) 487-5155

Radio Control Hawaii, 474 Kalanikoa St., S-104, Hilo, HI 96720; Glenn Shiroma, (808) 935-5629

Team PRC Racing Club, 176 Mamo St., Hilo, HI 96720; Charlie Kawamoto, (808) 935-3561

IDAHO

Almota Ranch Speedway, 1732 Eldridge Ave., Twin Falls, ID 83301; Casey Clements, (208) 733-8219

Capital Dirt Burners, 1612 Latah, Boise, ID 83705; Jim Small, (208) 433-1631

Dirt Stuff Plus, 5344 N. Yellowstone Hwy., Idaho Falls, ID 83401; Brian Krah, (208) 522-7576

ILLINOIS

Adams R/C Raceway, 7201 S. Adams, Bartonville, IL 61607; Ray Tighe, (309) 633-9300

AJ's Raceway & Hobby, 10211 Kestling Rd., DeKalb, IL 60115; A.J. Schultz, (815) 756-2772

C.I.R.C.A., 905 Bibbs St., Jacksonville, IL 62650; Sport 'n' Hobby, (217) 245-1375

C&R Hobbies, 39 E. Jones, Milford, IL 60953; Ray Craighead, (815) 889-4073

Depot Hobby Raceway, 180 S. Seminary St., Galesburg, IL 61401; (309) 342-9323

H & H Hobbies and Raceway, 9346 Virginia Rd., Lake in the Hills, IL 60102; Mike Hollingsworth, (847) 458-1777

Hans' RC Race Place, 2051 2100th St., Atlanta, IL 61723; Hans Bishop, (217) 648-2915

HobbyTown Raceway, 2103 N. Veterans Pkwy., Bloomington, IL 61701; Gary Pritts, (309) 664-4451

Leisure Hours R/C Raceway, 24121 W. Theodore, Bldg. 1, Plainfield, IL 60544; Scott Hill, (815) 439-1777 (track), (815) 439-1477 (shop)

Machesney Park, 1220 Shappert Dr., Machesney Park, IL 61115; (815) 282-1311

Marty's R/C Hobby, 1335 E. Broadway, Bradley, IL 60915; Gail or Marty, (815) 933-8441

Monroe R/C Raceway, 26049 Ridgeland Ave., Monee, IL 60449; Roy or Roberta Moody, (708) 534-2422 (track), (708) 799-5597 (office)

Outlaw R/C Speedway, 1614 Broadway, Mattoon, IL 61938; (217) 234-6229

Pontoon Raceway, 3670 St. Rte. 111, Granite City, IL 62040-4304; Pat or Skip, (618) 931-1206

Quad Cities Radio Raceway, 541 1st Ave. North, Silvis, IL 61282; Tom Bedwell, (309) 751-9663

Radio-Active Raceway, 751 N. Bolingbrook Dr., #15, Bolingbrook, IL 60440; Jim, (630) 759-7557

Rector's R/C Raceway, RR 3, Box 104, Albion, IL 62806; Tim Wolfe, (618) 842-9379 (M-F), (618) 446-3282 (Sun.)

RMR Raceways, 19091 West Casey Rd., Libertyville, IL 60048; Ron Rawald, (847) 549-6963

Shiloh Eagles Superspeedway, 308 N. Virginia Ave., Belleville, IL 62220; (618) 277-6030

SIRCAR Raceway, 1200 N. Marion, Carbondale, IL 62901; (618) 549-5885

Stanton Hobby Shop, 4718 N. Milwaukee, Chicago, IL 60630; Kevin Kane, (773) 283-6446

Valley Farms R/C Raceway, 706 Bypass 20, Cherry Valley, IL 61016; Dean or Debbie, (815) 332-4516 or (815) 547-5984

Wep Speedway, RR #2, Box 44, Lawrenceville, IL 62439; Bill Poe

INDIANA

Bremen Racing Ent., 308 N. Bowen, Bremen, IN 46506; Dale Heuberger, (219) 546-3807

The Dirt Yard, 1117 W. Epler Ave., Indianapolis, IN 46217; Keith Dudas, (317) 786-6417

GM Raceway, 1651 W. Franklin St., Elkhart, IN 46516; Pete Russell, (219) 293-1827

Hardesty R/C Raceway, 11 East Plymouth St., Hamlet, IN 4653; Max Hardesty, (219) 867-8600

Hobby Barn Raceway, 1950 Springhill, Terre Haute, IN 47802-9694; (812) 299-5773

Hobbytown U.S.A., 5385 E. 82nd St., Indianapolis, IN 46250; Bill Scott, (317) 845-4106

Nitro R/C Speedway, 4310 West 400 South, Danville, IN 46122; John Webber, (317) 539-4413; email: nitrorc1@aol.com

P&T Hobbies and Raceway, RR 2 (Hwy. 60), Mitchell, IN 47446; Paul Weber or Tom Logsdon, (812) 849-6666; email: pthobby@bigfoot.com

Race Street Hobbies, 1126 1/2 Race St., New Castle, IN 47362; Jim Burke, (765) 521-4888

RC Barn, 310 N 125 W, Monroe, IN 46772; Mark Lengerich, (219) 692-6600

R/C World of Indiana, 2246 West U.S. Hwy. 36, Lynn, IN 47355; Joe Kolp, (765) 874-2464; e-mail: rcworld@globalnet.net; web:www.RCWORLD.com

RC Mania, 8 Wood Ct., Hebron, IN 46341; Ron Trobaugh, (219) 996-6288 (shop); (219) 762-5365

The Rink, 7900 Whitcomb, Merrillville, IN 46410; Don Reiner, (219) 769-8113

Showtime Lot Racing, 606 Lower Huntington Rd., Fort Wayne, IN 46815; Mike Romines, (219) 478-6099

Summit Area Radio Cars (SARC), 7000 Red Haw Dr., Fort Wayne, IN 46805; John Kissel, (219) 492-2271

IOWA

Delb's Speedway, 423 11th Ave. So., Clinton, IA 52732; Rusti's Miniatures and Hobbies, (319) 243-2697

Dubuque R/C Speedway, Dubuque County Fairgrounds, Dubuque, IA 52001; Paul Conlon, (319) 556-2736

Hobby Haven, 7672 Hickman Rd., Des Moines, IA 50322; Rick Marble, (515) 276-8785

Inside Challenge, 2028 Main St., Keokuk, IA 52632; Jessie, (319) 524-2225

Iowa City R/C Racing Association, Johnson County Fairgrounds, Bldg 6, 3149 Old Highway 218 South, Iowa City, IA 52246; Hobby Corner, (319) 338-1788; fax (319) 356-6509; track is fully covered by roof

IROAR—Hawkeye Downs Raceway, Hawkeye Downs, 6th St. S.W., Cedar Rapids, IA 52404; Dave Kleinschrodt, (319) 556-8524

Manly R/C Club, Box 23 (Hwy. 65), Manly, IA 50456; Bruce Hill, (515) 454-2025

Marble's Raceway, 4685 SE 40 St., Des Moines, IA 50317; Rick Marble, (515) 282-7507

Mr. Car Raceway, P.O. Box 1112, Central Iowa Fairgrounds, Marshalltown, IA 50158; Jim Gossett, (515) 483-2234

Outback Speedway, 403 State St., Guthrie Center, IA 50115; Helens Enterprises, (515) 747-3064

Radio Control Raceway Park, 2100 First Ave. N., Fort Dodge, IA 50501; Bernie Halverson, (515) 576-3780

Riverside Raceway, Veteran's Park, Algona, IA 50511; Mike Beisch, (515) 295-9352

Shentona Speedway, 1215 W. Lowell, Shenandoah, IA 51601; Doug Cross, (712) 246-5984

Wild Bill's Raceway, 901 W. Jones, Knoxville, IA 50138; William Anderson Jr., (515) 842-5973

KANSAS

Ebersole Hobby and Raceway, 11417 W. Hwy. 54, Wichita, KS 67209; Sherri McWilliams, (316) 722-8888

Hobbytown USA, 216 S. 23rd, Lawrence, KS 66046; Kevin Decembarus, (913) 865-0883

Mike's R/C Hobbies, 121 SE 29th St., Unit #3, Topeka, KS 66605; Mike Barnard, (913) 266-5767

Ottawa Outlaw Raceway, 114 South Main, Ottawa, KS 66067; Tom Wilson, (913) 242-1450

R/C Supertown and T.O. Pro Shop, 14 E. Avenue A, Hutchinson, KS 67501; Cody or Joe, (316) 665-6633

R/C World Raceway, 217 Brownie Ave., Scranton, KS 66537; John and Kyle, (913) 793-2313

RCRC Raceway, 507 N. 4th, Atwood, KS 67730; Bob Dunker, (913) 626-3261

R.C.R.C. Raceway of Salina, 1300 E. Crawford, Bill Burke Park, Salina, KS 67401; Calvin Calp, (913) 823-9588

T.O. Pro Shop, 14 E. Ave. A, Hutchinson, KS 67501; Cody Jandrakovic, (316) 665-6633

KENTUCKY

Bourbon City Raceway, 213 West Stephen Foster Ave., Bardstown, KY 40004; Ryan Barnes, (502) 349-0069

Dixon's R/C RaceWay, 1428 Lost Creek Rd., Hazard, KY 41701; Jeff Dixon, (606) 436-4820

Johnny's Speedway, 3114 North St., Lloyd Greenup, KY 41144; Charles, (606) 473-0075

Pit Stop Hobbies, 106 A St., Benton, KY 42025; Robert Fitzgerald, (502) 527-8216

Rick's Hobby Farm, 2089 Park Rd., Hawesville, KY 42348; Rick Early, (502) 927-8527

Trio Hobbies & R/C, 216 Redmar Plaza, Radcliff, KY 40160; Maurice Johnson, (502) 351-7547

LOUISIANA

Al's R/C Store, 1529 Anita, Sulphur, LA 70663; Al Gasparid, (318) 625-5880 or (318) 437-8545

Baton Rouge Velodrome, 7122 Perkins Rd., Baton Rouge, LA 70815; Weldon Sharon, (504) 665-5616

Gator R/C Raceway, 3691 Hwy. 171 N., Lake Charles, LA 70611; Tony Diaz, (318) 855-3206

Indy Speedway & Hobby, 3753 General DeGaulle Dr., New Orleans, LA 70131; Vince Sheetz, (504) 367-1891

Pontchartrain Hobby Shop, 3755 Pontchartrain Dr., Slidell, LA 70458; (504) 649-1199

MAINE

Clay Bowl R/C Hobbies, P.O. Box 61, Greene, ME 04236; Pat Cap, (207) 946-5003

R/C Speedway & Hobbies, 87 Main St., Fairfield, ME 04963; David Prescott, (207) 453-4588

MARYLAND

Doug's Raceway, 2935 Grain Hwy., Waldorf, MD 20601; Doug Moran Jr., (301) 843-6220

Hobby Town USA, 8223-11 Elliot Rd.,

Easton, MD 21601;
Bill Dyke, (410) 820-9308



J.R.'s Race Place, 2935 Crain Hwy.,
Waldorf, MD 20601;
James Radford, (410) 947-2766



Outback R/C Race Club, Maiden Ln.,
Manchester, MD 21102; Randy or
Bonnie Henry, (410) 374-2878



The Track, 16806 Oakmont Ave.,
Gaithersburg, MD 20877;
Mimi Wong, (301) 417-9630



Big Boys Toys, 40 Father Davol Blvd.,
Fall River, MA 02721; (508) 677-9400



C&C Hobby & Raceway, 562 Russells
Mills Rd., So. Dartmouth, MA 02748;
Charlie, (508) 997-4131



Hi-Tech Hobbies, 1681 Broadway
(Rt. 138), Raynham, MA 02767;
Ruben, (508) 880-5373



Megadrome Raceway, Rt. 8, Curran
Hwy, North Adams, MA 01247;
Bob Blanchette, (413) 743-7223



Northboro Speedway, 168 Main St.,
Rte. 20, Northboro, MA 01532;
Bob Trimble, (508) 393-8087



D.R. R/C, 22789 Northline Rd.,
Taylor, MI 48180; Bobby or Fred,
(734) 287-7405



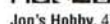
Freedom Hill R/C Raceway, 35372
Wellston, Sterling Heights, MI 48312;
Jim McKenna, (810) 268-3996



Great Lakes R/C Racer's Club, 1035
E. State St., Hastings, MI 49058; John
Warner, (616) 948-9798;
email: gtrklscrcw@aol.com,
www.members@aol.com/gtrklscrcw
/index.html



Hobby Hub, 5859 M99, Diamondale,
MI 48821; Verne Goebble,
(517) 337-9278 or (517) 351-5843



Jon's Hobby, 4739 E. Pickard, Mt.
Pleasant, MI 48858; Jon Beutler,
(517) 773-5412



JT Superspeedway, W. Golden Ave.,
Battle Creek, MI 49015;
Jerry or Sam, (616) 965-0116



Larry's Performance R/Cs, 43665
Utica Rd., Sterling Heights, MI 48314;
Larry, (810) 997-4840



Lazer RC Speedway, 2858 N.
Wilmoth Hwy., Adrian, MI 49221;
Russ Johnson, (517) 263-2806



Motor City Speedway, 1602523, mile,
Rd., Macomb Township, MI 48042;
Gary Cornwell, (810) 677-2470



N.M.R.C.C. Raceway,
Hobby Toy, Main St., Gaylord, MI
49735; Ed Schneider, (517) 732-3963



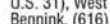
Ovalt's R/C Speedshop, 3920 N. U.S.
31 S., Traverse City, MI 49684; Jim
Ovalt, (616) 947-6670



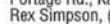
R.A.C.E. Inc., 3227 Mathews,
Jackson, MI 49203;
Sam Sprang, (517) 787-9161



Raw Roots Race Tracks, 14623 East
Croswell, 1/4 mile north on 152nd (off
U.S. 31), West Olive, MI 49460; Roy
Bennink, (616) 399-9338



R&L Hobbies & Racing, 9782
Portage Rd., Kalamazoo, MI 49002;
Rex Simpson, (616) 323-3686;
fax (616) 329-1744



Rodgers R/C Raceway, 7463 Ridge

Rodgers R/C Raceway, 7463 Ridge Rd.,
Britton, MI 49229; George Rodgers,
(517) 451-8301



Thumb Raceway, 3441 Main St.,
Marquette, MI 48453;
Jim Wilson, (517) 635-7848



Vicksburg Off-Road R/C Raceway,
50201 Silver St., Vicksburg,
MI 49097; Tim, (616) 323-7963



T.J.'s RC Raceway, Rt. 2, Box 22C,
Luther, MI 49656; Tod Smant, (616)
797-8035



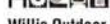
Village Hobbies-n-Crafts, 195 N. Elm,
Hesperia, MI 49421;
Alan or Fran, (616) 854-1374



Village R/C Raceway,
Prairie Ronde St., Decatur, MI 49045;
Chuck Nolke, (616) 423-7878



Washtenaw R/C Raceway, Ypsilanti, MI
48198; Jim Rousseau, (734) 395-5048



Willis Outdoor R/C Racetrack, 13922
Oakville-Waltz Rd., Willis, MI 48191;
Mike Higgins, (734) 587-2012



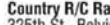
Bemidji R/C, 1015 Miles Ave. S.E.,
Bemidji, MN 56601; Russ or Ryan,
(218) 751-1629



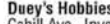
Car Town USA, 2822 Piedmont Ave.,
Duluth, MN 55811; Roger Deloach,
(218) 727-6248



Country R/C Raceway Park, 24214
325th St., Belview, MN 56214-8115;
Charles L. Steffl, (507) 641-8115



Duey's Hobbies & R/C Raceway, 6600
Cahill Ave., Inver Grove Heights, MN
55076; Duey Carlson, (612) 450-1721



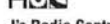
Grand Rapids R/C Speedway, 2209
Hwy. 2 East, Grand Rapids, MN 55744;
Aaron Voges, (218) 326-6751



Granite City R/C Speedway, 3555
Shadowwood Dr. N.E., East Hwy. 23,
Sauk Rapids, MN 56379; Brett
Donahue, (320) 251-6980



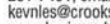
J's Radio Control Race Park, 22994
290th Ave., Starbuck, MN 56381;
Jay Campbell, (320) 239-4827



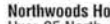
Kevin's Private Off-Road Raceway, 702
So. Washington Ave., Crookston, MN
56176-2317; Kevin Altepeter, (218)
281-7491; email:
kevin@crookston.polaristel.net;
www.kevinrcr.bizonthe.net (note: registra-
tion required for permission of use)



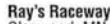
Northwoods Hobby Raceway, 2638
Hwy. 25 North, Brainerd, MN 56401;
Tom Grogg, (218) 829-9257



Ray's Raceway Park, 105 3rd Ave. NE,
Glenwood, MN 56334;
Dan Winter, (320) 634-5246



R/C Racing World, 235 Main Ave. North,
Harmony, MN 55939;
Mark McKay, (507) 886-5931 or
(507) 886-2224



Red Barn RC Raceway, Rt. 4, Box 333,
Mankato, MN 56001; Rusty Weiss,
(507) 345-8972



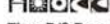
Southside Speedway, 2241 Marion Rd.
SE, Rochester, MN 55904;
Kevin Guy, (507) 281-3233



Time R/C Raceway, 20 West Lake St.,
Chisholm, MN 55719; RV,
(218) 254-4321



Joe McFaden Hobbies, 5531 Fox
Meadow Dr., Meridian, MS 39307;
Joe McFaden, (601) 483-7000

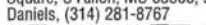


Small Cars Unlimited, 820 Cooper Rd.,

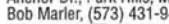
Jackson, MS 39212; (601) 372-FAST;
www.smallcarsunlimited.com



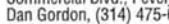
All Seasons Hobby, 29 O'Fallon
Square, O'Fallon, MO 63366; Bob
Daniels, (314) 281-8767



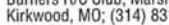
B&L Hobbies & Raceway, 2800
Anchor Dr., Park Hills, MO 63061;
Bob Marler, (573) 431-9444



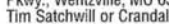
Fire Mountain Raceway, 8647
Commercial Blvd., Pevely, MO 63070;
Dan Gordon, (314) 475-6449



Greentree R/C Racepark, St. Louis Dirt
Burners R/C Club, Marshall Rd.,
Kirkwood, MO; (314) 831-2194



Hobbies 'N Stuff Raceway, 204 Mall
Pkwy., Wentzville, MO 63385;
Tim Satchwell or Crandall Olds,
(314) 327-6006



North Missouri Raceway, 223 Graves
St., Chillicothe, MO 64601; Billy
Johnston, (660) 646-1120



Ozark Mountain Speedway, Rt. #2,
Box 50, H-Highway and County Rd. 31,
Noel, MO 64854; Clayton Younker,
(417) 475-6222



Ozarks R/C Raceway, Hwy 13N,
Brighton, MO 65781; Gene Rhodes or
Ron Hawkins, (417) 742-4376 or
(417) 742-7223



Real Blue Vue Speedway,
12019 E. 47th St., Kansas City, MO
64133;
Mark Randol, (816) 358-0238



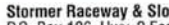
Real R/C Raceway, 24204 State Rt. 58,
Pleasant Hill, MO 64080;
Steve Hale, (816) 540-5584



Stormer Raceway & Slot Motorplex,
P.O. Box 126, Hwy. 2 East, Glasgow,
MT 59230; (406) 228-4569



Goodyear Speedway and Off-Road,
4021 North 56th, Lincoln, NE 68510;
Tom or Bob, (402) 464-5172



Hadar R/C Raceway,
55192 849th Rd., Norfolk, NE 68701;
John Schoenauer, (402) 644-7922



Hobby Town USA Raceway, N. 1st St.
& Cornhusker Hwy., Lincoln, NE
68508; Ben Smith, (402) 434-5056



Mr. Bill's, 450 West 2nd St., Hastings,
NE 68901; Bill J. Ries, (402) 462-4865



O.N.R.O.A.D., 3307 N. 58 St., Omaha,
NE 68104; Cook Jacobs,
(402) 556-8674



OTWG Carpet Raceway,
55129 849th Rd., Norfolk, NE 68701;
John Schoenauer, (402) 644-7922



RC Motorsport Off-Road Raceway,
5600 Mass Rd., Papillion (Omaha),
NE 68133; Marty Stepanek,
(402) 593-6133



Salvation Army South Corps, 4032
Harrison St., Omaha, NE 68164;
(402) 734-3414; fax (402) 734-3415



T & T Raceway, 476 26th Ave.,
Columbus, NE 68601; Tom,
(402) 564-9216



The Speed Zone, 1524 Atokad Dr.,
South Sioux City, NE 68776;
Rob Murdock, (712) 428-4679,
or Jim Carson,
(712) 274-7731



Wacha's R.C. Speedway, 1823 23rd

Wacha's R.C. Speedway, 1823 23rd St.,
Columbus, NE 68601; Tom Smith,
(402) 564-9216



Bill's Hobby Shop, 1000 N. Nellis Blvd.,
Las Vegas, NV 89110; Bill Schultz, (702)
531-3282; website:
www.billshobbyshop.com



Dansey's Indoor R/C & Hobbies,
741 N. Nellis, Las Vegas, NV;
David Lugo, (702) 453-RACE,
(888) 675-8963; www.danseys.com



Lizard Raceway, P.O. Box 1248, Verdi, NV
89439; Jeff Griffin, (702) 345-6573



Axis Racing R/C Dragway,
4197 High St., Exeter, NH 03833;
Dan Peterson, (603) 659-4877



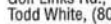
Economy R/C Speedway, 4 Maple St.,
Winchester, NH 03470; Harold Thomas,
(603) 239-4482 or 239-6470



North Haverhill R/C Racing, Main St., N.
Haverhill, NH 03774, Shelly White, 111
Golf Links Rd., Wells River, VT 05081;
Todd White, (802) 757-2579



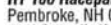
Robert's Railroad & Hobbies, 1335 1st
NH Turnpike—Rt. 4, Northwood, NH
03261; Robert M. Jeffers Jr.,
(603) 942-5193



RT 106 Racepark, 743 Clough Mill Rd.,
Pembroke, NH 03275;
Fred Farwell, (603) 224-RACE



American Raceway,
142 Wilson Ave., Englishtown, NJ 07728;
Doug Venner, (732) 446-3737;
email: DMC12@prodigy.net



America's Hobby Center Inc., 8300
Tonnelave Ave., North Bergen, NJ 07047;
John Many, (201) 662-0777



Checkerboard Raceways,
P.O. Box 240, Elwood, NJ 08217;
Ray Murray, (609) 629-4809



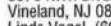
Family Hobbies Raceway,
3576 N.W. Blvd. & Weymouth Rd.,
Vineland, NJ 08360;
Linda Vogel, (609) 696-5790



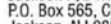
Jackson R/C Racing,
P.O. Box 565, Christopher Columbus Blvd.,
Jackson, NJ 08527; Al Sodano,
(732) 364-6422, or Ed,
(732) 928-8963



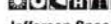
Jefferson Speedway, 5494 Berkshire
Valley Rd., Oak Ridge, NJ 07438;
(201) 697-7525



Jerry's Hobby Center & Raceway,
336 Rt. 22W, Greenbrook, NJ 08812;
Jerry or Gary, (908) 752-6030



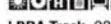
LBRA Track, 392 Warburton Pl.,
Long Branch, NJ 07740;
(908) 222-5122



Millville R/C Oval, 114 N. High St.,
Millville, NJ 08332;
William Denstoz, (609) 327-4640



On Trax Hobbies, 3101 Rte. 70, Browns
Mills, NJ 08015; Joseph DiGirolamo,
(609) 735-0422



South Jersey Cost Controlled Racing, 25
Jackson Ln., Sicklerville, NJ 08081;
Ray Murray, (609) 629-4809



The Race Place, 1151 Hwy. 33,
Farmingdale, NY 07731;
John Fary, (908) 938-5215



Charlie's Hobby Shop, 225 E. Idaho,
Ste. 11, Las Cruces, NM 88005; Kim,
(505) 541-1097



Las Cruces R/C Racer's Association,
Meerscheid Recreation Center,
Walnut and Hadley by BMX, Las
Cruces, NM 88001; D.J. Clark, (505)
546-4269; email, jade@zianet.com;
www.zianet.com/jade/
lcrca.htm;



BarnStormers Speedway,
205 Gray Court Rd., Chester, NY
10918; Lou, (914) 469-6468;
trackside (914) 469-8206



Brennan's R/C Hobbies, 6368 State
Rt. 5, Vernon, NY; Bill or Tom
Brennan,
(315) 429-4930



Brownie's Pro & Sport Hobbies, 124
Bennett St., Staten Island, NY 10302-
1426; John Brown, (718) 727-2194



Bruckner Racing, 2908 Bruckner
Bld., Bronx, NY 10465;
Thomas Baff

Jamestown, NY 14701; (716) 488-1772

NEW YORK

P.R.O. Speedway, 5 Washington St.,
Cattaraugus, NY 14719;
Marc Pritchard, (716) 257-3101
R/C Competition Corner, 2202
Brewerton Rd., Mattdale, NY 13211;
Lori and Cos Cirriello, (315) 455-8718

Radio Hill Raceway, 1219 Shannon
Corners Rd., Dundee, NY 14837;
Bill Brewer, (607) 243-8641 or
Greg Areford, (607) 243-7899

Rampage R/C & Hobbies, 782 Rt. 9G,
Rockledge Plaza, Hyde Park, NY 12538;
Brian Walker or Kevin Bobb,
(914) 229-1379

R/C Competition Corner, 2202
Brewerton Rd., Mattdale, NY 13211;
Lori and Cos Cirriello, (315) 455-8718

Silver State R/C Club, Centennial Park,
Carson City, NV 89501;
(702) 853-3953

Southern Tier Raceway,
88 Paige St., Owego, NY 13827;
Anita Harding, (607) 687-5395

South Shore Hobby & Raceway
464 East Main St.,
Patchogue, NY 11772;
Benny or Bonnie, (516) 758-5567

Tri County Remote Control Car Club,
33 West Decker St., Johnstown, NY 12095;
Tom Leville, (518) 725-1279

TARMAC—Ultimate R/C Raceways,
2830 Mountain View Rd., Poughkeepsie,
NY 12603;
Todd, (914) 342-5409;
Greg, (914) 528-5084;
trackside, (914) 454-8276;
www.tarmacraceway.com

Walt's Hobby, 2 Dwight Park Dr.,
Syracuse, NY 13209; (315) 453-2291

Westfield R.C. Speedway,
27 Clark St., Westfield, NY 14787;
John or Jared Lindstrom,
(716) 326-2339; 716-326-2309

Whitestone, 30-56 Whitestone Expy.
(Dept. of Motor Vehicles), Flushing, NY
11374; Rudolf Ardilla, (718) 966-6155

Willis Hobbies R/C Speedway, 300
Willis Ave., Mineola, NY 11501;
Ken Ford, (516) 746-3944

ZOAR Road Speedway, 15318 Armes
Ct., Gowanda, NY 14070; David &
Gordon Ackler, (716) 532-9463

NORTH CAROLINA

A&J R/C Models, 2051 Anthony Rd.,
Burlington, NC 27215; Jerry Love or
Andrea Thompson, (336) 227-4556;
fax (910) 227-1001

The Antique Barn, 2810 Forest Hills Rd.,
Wilson, NC 27893; (252) 237-6778

Atlantic Coast R.C., 8-A Lockhead Ct.,
Greensboro, NC 27409; Charlie Higgins
or Harry Johnson, (336) 664-1277

Badin Shore Raceway, 1730 Jackson
Lake Rd., High Point, NC 27263; Jimmy
or Tim Martin, fax (910) 431-6407

C/C Hobby Speedway, 8358 U.S. Hwy.
220 Bus. N., Randleman, NC 27317;
Steve & Mary Cox, (910) 495-3482

C/W R/C Speedway, 1297 Charlotte
Hwy., Asheville, NC 28730;
Billy or Tim, (828) 684-0061

Carolina Dragway, 1555 Turkey Hwy.,
Clinton, NC 28326; (910) 592-9489

Chatham R/C Raceway, 326 Reno
Sharpe Store Rd., Bear Creek, NC 27207;
Dwight Fields, (919) 898-2991

Chatham R/C Raceway, 326 Reno
Sharpe Store Rd., Bear Creek, NC 27207;
Dwight Fields, (919) 898-2991

Green Flag RC Raceway,
107 Harley Rd., Wilmington, NC 28401;
Mike McLemore, (910) 452-1620

R & D Speedway,
418 Main St., Tarboro, NC 27886;
John Dupree, (919) 823-2294

Ride & Slide R/C Raceway,
5319 Yaddin Rd., Fayetteville, NC 28303;
Bill Culbertson, (910) 867-4202

Radio Jockey's Parkway, "RJ's,"
Rt. 9, Box 651, Fay, NC 28301;
www.wave-net.net/mshutt;
Tony Starling, (910) 486-4820

R.C.R. Speedway, 1415 Henderson
Grove Church Rd., Salisbury, NC 28147;
Ronnie Linker, (704) 637-2565

Rosewood R/C Speedway, 651
Community Dr., Goldsboro, NC 27530;
Glenn Elam, (919) 731-4734

Southern RC Motorsports Club, Hwy.
17S., P.O. Box 1651, Shallotte, NC
28459; Mark Whitt, (910) 754-4902 or
Eddie Ferster, (910) 754-8528

Youngsville R/C Club, 6516 NC 96 Hwy.
W., Youngsville, NC 27596; James Ray,
(919) 556-0446

NORTH DAKOTA

Northern Mini Racers,
1000 36th St. S.E., Minot, ND 58702;
Mike, (701) 838-5818

River City R/C, 2714 Main Ave.,
Fargo, ND 58103;
Chris Hughes, (701) 235-1272

OHIO

AK Hobby and Raceway,
3826 North Bend, Cincinnati, OH 45211;
Tim Tolle, (513) 661-7080

American Ohio Sprint Car,
1708 Empire Rd., Wickliffe, OH 44092;
Gary Waldheim, (440) 944-9966

Classic Hobbies, 1994 E. Waterloo Rd.,
Akron, OH 44312; Walt Ellis,
(330) 733-6400

CORCAR/Sams Club, 128 Amity Rd.,
Galloway, OH 43119-8732;
Bill Stevenson, (614) 870-7159

Columbus R/C Racing Club (C.R.C.R.C.),
Franklin County Fairgrounds, Hilliard,
OH 43026;
Jeff Crowell, (614) 236-1783

D&J R/C Raceway, 801 W. Market St.,
Orville, OH 44667; Don Yoder or Mark
Nussbaum, (330) 682-4266

Full Throttle Raceway, 600 Mt. Moriah
Rd., Cincinnati, OH 45255;
Bill Dolch, (513) 943-9009 or via pager
at (513) 730-1073

Glass City Radio Control,
2620 Ivy Pl., Toledo, OH 43613;
Frank Johnson, (419) 472-1286

Greentown R/C Raceway, 3353
Perrydale, Greentown, OH 44630;
Chuck Lambert, (330) 364-6585

Hobby Shop Raceway, 2096
Miamiaville Center Rd.,
Centerville, OH 45459;
The Hobby Shop, (937) 436-6161

Hobby World, 3499 SR 59,
Ravenna, OH 44266;
Tom Fry, fax (330) 296-0894

J & L R/C Raceway, 5342 W. St. Rt. 718,
Troy, OH 45373; Mike Wegman, (513)
521-3408; email: wegm@one.net

Lafferty R/C Raceway, Box 153, 70228
Hurray St., Lafferty, OH 43951;
Chris Christman, (740) 968-4818

Mid American Raceway, 13150 Airport
Hwy., Swanton, OH 43558;
Bill or Chuck, (419) 475-9459

Nothing But Air R.C. Track,
34632 True Rd., Logan, OH 43138;
Gary Lloyd, (740) 385-0288

Shiray's Hobby & RC Raceway, 19930
State Route 117, Waynesfield, OH
45896; Ray Zimmerman,
(419) 568-8055

TARCAR, 7216 Nebraska Ave., Toledo,
OH 43617; Bill Bridges, (419) 826-3859

Van Wert R/C Raceway, 144 E. Main St.
(above Hoverman Music), Van Wert, OH
45891; Mark Davis, (419) 232-2112

Y-City Hobby & Speedway,
120 S. 6th St., Zanesville, OH 43701;
Kevin McKenna, (674) 455-3025

OKLAHOMA

Adams Creek R/C Speedway, 5207 S.
194th E. Ave., Broken Arrow, OK 74014;
John Beigle, (918) 355-1416

Competition R/C, 100 S.E. 89th,
Oklahoma City, OK 73149; James or
Louise Brown, (405) 634-0809

Enid R/C Speedway, 1821 S. Van Buren
(Hwy 81), Enid, OK 73701; Bob, (580)
233-3344 or (580) 234-7666

Wild Country Speedway, 127 S. Main,
Porter, OK 74454; Charles McCollough,
(918) 685-0372 or
(918) 687-1686

OREGON

Competition Racing Association,
17941 N.E. Gleason, Portland, OR
97230; Mark Taylor, (503) 761-1334

D.I.R.T. R.O.A.D. Club, 65540 73rd St.,
Bend, OR 97701; Daley and Edward
Gietz, (541) 388-2932 or (800) 475-
6040, ext. 777 (at 2nd dial tone, enter
ext.); email: blue@coinet.com

R/C Plus Hobbies Raceway,
1857 25th St. S.E., Salem, OR 97302;
Ron Smith, (503) 364-9188

R/C Speed Center, 2810 N. Pacific Hwy.,
Medford, OR 97501; Gene and Betty Jean
Skellton, (541) 779-8298

Rose City Scale Racing, Highway 224,
K-Mart parking lot, Milwaukie, OR
97222; Rick Strauss, (503) 631-2929

Yamhill County R/C Car Club,
722 Morgan Ln., McMinnville, OR
97128; Larry Rucker, (503) 472-7234

PENNSYLVANIA

Courtview Raceway, 20 S. Main Street
(lower level), Washington, PA 15301;
Aaron Stimmell Jr., (724) 225-4302

DC Ultra Trax, 13 York Rd.,
Wycombe, PA 18974;
David Cowan, (215) 672-5200

Dreamboat Hobbies,
2810 Pennsylvania Ave. W., Warren, PA
16365; Louie Dussia, (814) 723-8052

Koontz's Home & Hobby Center,
1205 Hoover St., Pittsburgh, PA
15204; (412) 331-3866

Kranzel's R/C Raceway & Hobbies,
415-B Bosler Ave., Lemoyne, PA
17043; David or Stuart Kranzel,
(717) 737-7223

Little Plum R/C Hobbies,
RR 1, Box 330, Lock Haven, PA 17745;
Larry Duck, (570) 769-1984

Lugnut Raceway, 1713 Bethlehem
Pike, Hatfield, PA 19440; Bill Henning
or Kathy Anderson,
(215) 822-5831

Marshall's R/C Raceway, RR 4, Box
640, Honesdale, PA 18431; Bill or Dot
Marshall, (570) 729-7458

McCullough's Offroad, 108 Callen Rd.,
Sarver, PA 16055; Doug McCullough,
(724) 352-0116; email:
DMCull323@aol.com

The Mushroom Bowl, 960 W. Cypress
St., Kennett Square, PA 19348;
Bruce or Drew,
(610) 444-1850

Pinion Twisters, 3M Plant, Green Ln.
and Mitchell, Bristol, PA 19007;
Mark, (215) 632-2344
or Tony, (215) 742-3560

Pit Stop Hobbies, 262 W. Main St.,
Mount Joy, PA 17552;
James Stoudt Jr., (717) 653-6222

Prop & Wheels Raceway,
139 W. Broad St., Tamaqua, PA 18252;
Gil Walters, Prop & Wheels Hobbies,
(610) 668-2288

Racers Edge R/C Racing, RR#1, Box
271, Smethport, PA 16749; Rick
Morgan or Johna Simar, (814) 887-
2269; email: morgan@penn.com;
web:users.penn.com/~morgan/track.html

The Raceway at River Junction,
1216 4th St. (behind cemetery),
Beaver, PA 15008; (724) 728-5571

RC Ave. Raceway,
324 McKinley Ave., Latrobe, PA
15650; Scott Smith, (412) 537-5501

RC Outfitters RCO Raceway,
519 Broadway, Hanover, PA 17331;
Chris Shaffer, (717) 633-9490;
http://rco.webjump.com

R/C Pro III, 910 Chestnut St.,
Coal Twp. (Shamokin), Shamokin, PA
17866; John Swisher,
(570) 648-7763

Riverside Raceway, Penna. Ave. W. &
Hickory, Warren, PA 16365;
Jeff, (814) 723-4211

S.A. Hi Banks, Hahn's Dairy Rd.,
Palmerston, PA 18071;
Scott Andrews, (610) 826-4583

Somerset Hobby Shop Outlet, 4309
Glades Pike, Somerset, PA 15501; Bob
Rhodes, (814) 445-6214

Staub Bros. R/C Speedway,
31 Locust St., Gettysburg, PA 17325;
Todd or Scott Staub,
(717) 334-5445

TnT Raceway, Randolph Rd.,
Great Bend, PA 18821; Frenchie,
(607) 775-1750 or Ed Kraft,
(570) 967-2604

Trains & Lanes Raceway, 3825
Northwood Ave., Easton, PA 18045;
Jeff Setzer, (610) 253-8850,
(800) 447-4891

Willow Mill Speedway, 37 N. Season's
Dr., Dillsburg, PA 17019; George
Verbowitz, (717) 432-4445

**World A.T.L.A.S./P.A.R.C.E. R/C
Raceway Hobby Shop & R/C Club**,
Chester Exchange Mall,
10th & Morten St.,
Chester, PA 19013; Darryl, Lee or
Marc, (610) 874-2540

PUERTO RICO

Area 51 On Road Track, Carr 931
KM 1.5, Bonavaro, Gurabo,
PR 00745; (787) 739-1572

Cidra R/C Track, Carr 7787 KM 1.6,
Bo Beatriz Adentro, Cidra, PR
00739; Humberto (Tito) Lizardi,
(787) 739-1572

Dorado Offroad R/C Track,
Pista Atletica Bo. Higüillar, Dorado,
PR 00646; Roberto Lamoso/Jaime
Ramos,
(809) 796-5603 or (809) 796-1734

Hacienda Muñoz R/C Track,
Carr. #14, Juana Diaz, PR 00795;
(809) 837-7083

Hi-Speed C Raceways,
422 San Claudio Ave., San Juan, PR
00926; Carlos Ortiz, (787) 283-0198

Isabela R/C Track, 390 Sur
Guaynabo, PR 00969; Fernando
Salcedo or Alvaro Obregon, (787)
720-1176

RHODE ISLAND

Tri-State R/C Raceway, 205 Hallene
Rd., Warwick, RI 02886;
Raymond Dean, (401) 738-4908

SOUTH CAROLINA

Atlantic World of Hobbies, 2458
Remount Rd., North Charleston, SC
29406; Jimmy Closson,
(843) 554-3546

Bethany Motor Speedway, 959
Wilmoir Rd., Clover, SC 29710;
Eddie Spearman, (803) 222-4758

Carolina R/C Speedway, 4148
Calhoun Memorial Hwy., Easley, SC
29640; Craig Prial, (864) 295-1209;
www.carolinarc.com

Darlington R/C Raceway, Hobbies
& More, 1570 S. Main St.,
Darlington, SC 29532;
(843) 393-0355

Extreme R/C Raceway,
5976 Grace Ln.,
Myrtle Beach, SC 29577;
Kevin Bullock, (803) 236-2083

The Grove Racing Center, 939 S.
Anderson Rd., Rockhill, SC 29730;
Mike Durham or Don Faris,
(843) 327-4121

Hobbies and More,
1570 S. Main St., Darlington, SC
29532; Jerry Pollard,
(803) 393-0355

J&M R/C Hobbies,
5341 Dorchester Rd., Evanston
Plaza, N. Charleston, SC 29418;
Mike Smith, (803) 552-9449

ORA Atomic Racing Facility,
373 Boyd Pond Rd., Aiken, SC
29803; Bill Jackson,
(706) 855-0846 or (803) 642-0314

SkateLand USA, 202 Hwy. 29,
Anderson, SC 29621; Jon Fulmer,
(864) 225-1840; touring cars only
on asphalt and oval

SOUTH DAKOTA

Action R/C Raceway,
107 N. Main, Mitchell, SD 57301;
(605) 996-6895

Ed Smithback, (605) 528-7345

DAKOTA

Dakota Off-Road Racers,

2989 W. Br. Co. 12, Aberdeen, SD 57401; (605) 226-0604

GOLDTRAX

Goldtrax Raceway,

409 E. High, Lead, SD 57754; Steve Brown, (605) 584-2355

TRI-STATE

Tri-State R/C Club, Sioux Empire Fair Grounds, Sioux Falls, SD 57105; Chad Walth, (605) 357-9654; email: losimam@email.msn.com

R/C ACTION

R/C Action Raceway, SE Corner at 484th & Hwy. 38, Sioux Falls, SD 57105; Brian Cox, (605) 373-0511

TENNESSEE

D&M's Downtown Raceway, 2703 U.S. Hwy. 411S, Maryville, TN 37603; (423) 681-8919

FUTRELL'S

Futrell's R/C Hobby Shop, 1715 Jackson Ave., Seymour, TN 37865; Dan Futrell, (423) 908-9526

HOBBY TOWN

Hobby Town USA, 2000 Mallory Ln., Franklin, TN 37067; Bobby Mills, (615) 771-7441

MID-SOUTH

Mid-South Racing Association, 9155 Hwy. 72 (Poplar Ave.), Germantown, TN 38138-7903; (901) 757-8774

R & R RACING

R & R Racing Portable Track, RR3, Box 34, Linden, TN 37096; Ross or Ron, (931) 589-5433

TNT

TnT Raceway, 643 Loop Hollow Rd., New Tazewell, TN 37825; Cliff Swett, (423) 869-8942

W.O.W.

W.O.W. Raceway, 59 Luray Rd., Beech Bluff, TN 38313; Kelly Bean, (901) 427-7874; email: windix60@pipeline.com

TEXAS

215 Speedway, 1814 County Rd. 215, Abilene, TX 79602; Clyde Gardner, (915) 673-2351

B&B

B&B R/C Hobbies, 700 East 4th, Big Spring, TX 79720; Walter Bumbulis, (915) 263-1790

BIG MIKE'S

Big Mike's R/C Raceway, 1405 W. Cotton St. (behind the Locker Room), Longview, TX 75604; (903) 297-7814

COMANCHE TRAIL

Comanche Trail RC Park, City Park, Big Spring, TX 79720; Allen Nichols, (915) 263-4241

DISCOUNT

Discount Hobbies, 1722A West Anderson Loop, Austin, TX 78757; Tony Bermudez, (512) 458-2324

DRYCREAK

Drycreek Raceway, 5903 Co. Rd. 2297, Quinlan, TX 75474; Micky Alphin, (903) 883-4060

EASTLEX

Eastlex Raceway, 45000 Hwy. 59 N., New Caney, TX 77357; Brent Mahaffy, (713) 399-9777

FINISH LINE

Finish Line Raceway, 2775 N. Hwy. 360, Ste. 637, Grand Prairie, TX 75050; Steve Manning, (817) 652-3340

HAL'S

Hal's Hobby Raceway, 1440 Bessemer, El Paso, TX 79936; (915) 591-2213

HOBBIETOWN

Hobbytown USA, 999 E. Basse Rd., Ste. 177, San Antonio, TX 78209; Joe Sena or Clark Baisdon, (210) 829-8697; fax (210) 829-8707

ISSAC'S

Issac's Race Track, 18177 Gulf Frwy., Houston, TX 77598; Issac Ben-Ezra, (281) 488-8697

MBRC

MBRC Off-Road Raceway, 204 D&E Valley Ln., Kennedale, TX 76060;

Mike Battaile,

(817) 563-1900

MAMMOTH

Mammoth R/C Racing, 4221 Spencer, Pasadena, TX 77504; John, (713) 946-2522

MIKE'S HOBBY SHOP

Mike's Hobby Shop Superstore and Raceway, 1605 Crescent Cir., Carrollton, TX 75006; (972) 242-4930; www.mikeshobbyshop.com

NORTH HOUSTON

North Houston Speedway, 11847 Spears Rd., Houston, TX 77067; Bob or Carol Hillin, (713) 872-2471

PERFORMANCE

Performance Raceway, 1106C Witte Rd., Houston, TX 77055; Jorge Tabush or Terry Schmid, (713) 464-4458

REV II UP

Rev II Up Raceway Practice Track, 3076 Kellar Rd., Smithville, TX 78957; Rev, Alton T. Edwards, (512) 237-5903

RICK'S

Rick's R/C Raceway, 238 Scenic Loop, Boerne, TX 78000; Rick, (210) 981-2245 or Rich, (210) 590-1805

ROUGH COUNTRY

Rough Country, 905 Jacksboro Hwy., Wichita Falls, TX 76301-5310; Robert Kerr, (817) 322-2453

STAR/CAR

Star/Car Raceway, 5802 Patton St., Corpus Christi, TX 78415; Glen Stead, (512) 949-8525; Race Hotline, (512) 881-6105

T&T EAGLE

T&T Eagle, 161 W. Spring Creek Pkwy., #601, Plano, TX 75023; Tony Welborn, (214) 517-0562

TERMINAL VELOCITY

Terminal Velocity R/C Raceway & Supply, 200 Wallington, Ste. 223, El Paso, TX 79902; Rick or Frank, (915) 534-9198

TEXAS SPEEDWAY

Texas Speedway, 6707 Chimney Rock, Bellaire, TX 77401

TIGER'S DEN

Tiger's Den R/C Speedway, 702 E. Broad St., Mansfield (DFW), TX 76063; Bob Burns, (817) 477-5513

T.O. OFFROAD

T.O. Offroad Raceway, 6236 Quail, El Paso, TX 79924; Efrén Saenz, (915) 821-7522

WAREHOUSE

Warehouse Radio Controlled Raceway, 5119 Plains Blvd., Amarillo, TX 79101; Craig or Darren Waddell, (806) 356-9080

W.E.S.

W.E.S. Hobby Race, 980 S. Fourth St., Beaumont, TX 77701; Edmond Richards, (409) 839-4929

WILD BILL'S

Wild Bill's Raceway, 535 E. Shady Grove, Irving, TX 75060; Lynn Morgan or Tom Nix, (214) 438-9224

UTAH

INTERMOUNTAIN

Intermountain R/C Raceway, 8481 W. 2700 S., Magna, UT 84044; David Mott, (801) 250-8303;

PAYSON

Payson R/C Raceway, 955 S. Main, Payson, UT 84651; Gus Wood, (801) 224-3852 and Lasca Wood, (801) 222-8677

VISION

Vision Hobby, 352 N. State St., Orem, UT 84057; Ken Rice, (801) 226-6226

WOR

WOR R/C Raceway, 3170 Brinker Ave., Ogden, UT 84401; Brian Worton, (801) 393-2530

VERMONT

Barre Town R/C Club, 14 S. Main St., Wall St. Complex, Barre, VT 05641; Russ Tribble or Pete Perreault, (802) 888-2860 or (802) 476-9458

BRADFORD

Bradford R/C Racing, Main St., Bradford, VT 05033; Seth Bean, (802) 222-9674

EMPIRE

Empire Hobbies Off-Road Raceway, 272 North Main St., Saint Albans, VT 05478; Scott or Jen;

(877) 4-HOBBIE; email:

mpirhobe@togethr.ne;

STOUGHTON POND

Stoughton Pond R/C, Perkinsville, VT 05151; Rick Adams, (802) 263-9321

VIRGINIA

Brad's Hobbies, 1105 Greenville Ave., Staunton, VA 24401; Brad, (540) 885-3642

BROWN BROTHERS

Brown Brothers Hobbies, 924 N. Main Street, Dumfries, VA 22026; Joel or Bob Brown, (703) 221-5746

COOPER'S

Cooper's R/C Race Center, 4000 Sago Rd. (969), Chatham, VA 24531; Norris Cooper, (804) 724-7342 or (804) 724-4182

DRCW

DRCW Raceway, Debbie's RC World, 2200 Commerce Pkwy., Virginia Beach, VA 23454; Les Modlin, (757) 340-6681

GLOUCESTER

Gloucester Scale Hobbies, 2352 George Washington Memorial Hwy., Hayes Plaza, Hayes, VA 23072; Rob Thein, (804) 642-3484

HAMPTON

Hampton RC Speedway, 1920 E. Pembroke Ave., Hampton, VA 23663; Steve Long or Mickey Kern, (757) 723-1884; website: www.fortunecity.com/olympia/norman/26/

HOBBIY HANGERS

Hobby Hangers Speedway, 14014 D Sullyfield Cir., Chantilly, VA 20151; Kwang or Billy, (703) 631-8820

THE HOBBY

The Hobby House, 116 Edds Ln., Sterling, VA 20165; Oppie, (703) 444-0333

K & W

K & W Hobby and Sports, 5186 Nine Mile Rd., Richmond, VA 23223; Ross Martin, (804) 737-3904

KC'S

KC's Radio Control & Repair, Rt. 4, Box 312, Trents Ferry Rd., Lynchburg, VA 24503; Curtis or Kim Wright, (804) 364-8596

OLDE TOWNE

Olde Towne Hobby Shoppe, 9105 Center St., Manassas, VA 22110; Arnie Levine, (703) 369-1197

RACE

Race World Hobbies, 6102 Lakeside Ave., Richmond, VA 23228; Larry Boyd, (804) 553-8040

THE RACER'S

The Racer's Edge, 1230 West Main St., Danville, VA 24541; Al Harville, (804) 792-6011; email: webmaster@theracersedge.virtu-

alave.net; http://theracersedge.virtu-

ROADMASTERS/

Rick's Hobbies, 12201 Balls Ford Ave., Manassas, VA 22110; Rick, (703) 330-6833

SHAMROC

Shamroc Raceway, 106 Cheviot Pl., Stephens City, VA 22655; Scott Janow, (540) 869-3551; note: track is located in Winchester, VA

THUNDER

Thunder Road RC Racing, P.O. Box 1022, Troy, VA 22974-1022; James Palmer, (804) 589-8174

THE TILTYARD

The Tiltyard, 6994 Tiltyard Dr., Dayton, VA 22821; (540) 828-3476; www.tiltyard.com; tiltyard@rica.net

TRAINLANO

Trainlano R/C Racing, 5661 Shoulders Hill Rd., Suffolk, VA 23435; Frank Stevens, (757) 488-5454

WASHINGTON

Alfie's, 108 South K St., Aberdeen, WA 98520; (360) 533-6638

A-MAIN

A-Main Raceway, 14011 N.E. 3rd Ct., Vancouver, WA 98685; Monty Coleman, (360) 571-8404

BEAR CREEK

Bear Creek Raceway, 6319 Maltby Rd., Woodinville, WA 98072; Nathan Brockway, (425) 398-0140

BURIEN

Burien Toyota R/C, 15025 1st Ave. South, Seattle, WA 98148; Ray Meek, (800) 654-6456

C&C

C&C Raceway, 266 Lind Ave. N.W., Renton, WA 98055; Charles Lakin, (206) 227-5167

CEARDARDALE

Cedardale Raceway, 1673 Cedardale Rd., Mount Vernon, WA 98273; Joe Madonia, (360) 659-0072; email: getshell@halcyon.com

FOUR SEASONS

Four Seasons R/C Racing, 2941 Sleater Kinney Rd. N.E., Olympia, WA 98506; Gary and Sharon Brown, (360) 491-2430

HANK PERRY

Hank Perry Raceway, 1901 N. Sullivan Rd., Spokane, WA 99023; Thom Mullins, (509) 928-2009

HANNAGAN

Hannagan Speedway, 4212 Hannagan Rd., Bellingham, WA 98225; Dana Hoggarth, (360) 734-4090

RACE CITY

Race City, 125 E. Main St., Auburn, WA 98002; Craig Haslebacher, (253) 939-2515; trackside (253) 939-2515

SARCAR

SARCAR Club, 700 Renton Village Pl., Renton, WA; Darylene Dennon, (425) 483-8210

SCHMIDT'S

Schmidt's Auto Parts, 10305 Old Hwy. 99, Marysville, WA 98271; Jon Failia, (206) 653-8838

SPokane

Spokane Indoor Raceway, 6422 E. 2nd Ave., Spokane, WA 99212; Dave Mapston, (509) 534-RACE

TACOMA

Tacoma R/C Raceway, 6305 6th Ave., Tacoma, WA 98406; Scott Brown, (206) 565-1935

TEAROR

Tearor Raceway, Fantasy World Toy and Hobby, 7901 S. Hosmer, Tacoma, WA 98408; Dave Kleinman, (206) 473-6223

ULTIMATE

Ultimate R/C Raceway, 907 Cole St. #3, Enumclaw, WA 98022; Dan Daugherty, (360) 802-2388

WEST COAST

West Coast Hobby & Raceway, 2239 Stevens Dr., Richland, WA 99352; Darren Shank, (509) 375-4995

ZEP'S

Zep's Hobbies & Raceway, 530 Interlake, Moses Lake, WA 98837; Steve Ralph, (509) 765-8191

WEST VIRGINIA

BURR-FAB

Burr-Fab Raceway, 90 Davis St., West Union, WV 26456; Mark Travis, (304) 873-2487

FULTON'S

Fulton's R/C Raceway, 2646 Chapline St., Wheeling, WV 26003; James Fulton, (304) 233-5355

LEFT TURN

Left Turn Hobbies, 100 Saco Ln. (by Post Office), Glen White, WV 25849; Stretch, (304) 255-3930

RACE

Race Zone, Hopewell Rd., Rt. 8, Box 343A, Fairmont, WV 26554; Joe Clutter, (304) 368-1000

WVRC

WVRC R/C Club, 142 W. Main,

Bridgeport, WV 26330; D.W. Weed

WISCONSIN

ABC R/C Inc. & Raceway, 244 W. Main St., Waukesha, WI 53186; Dick Mathiesen, (414) 542-1245

GARY'S

Gary's Hobby Center, 3701 Durand Ave., Racine, WI 53403; Bill Phalen, (414) 554-8884

HEART OF THE VALLEY

Heart of the Valley R/C Club, 1330 Midway Rd., Menasha, WI 54952; Bill Morgan, (920) 954-1695

HOBBIETOWN

Hobbytown USA, 2061 South Koeller, Oshkosh, WI 54901; (414) 426-1840

HOBBIETOWN

Hobbytown USA - Revolution, Memorial Mall, 3347 Kohler Memorial Dr., #D2, Sheboygan, WI53081; Kenny, (920) 452-0801

JJ'S

Complex, Gateau Bay, NSW 2261; Peter J. Knight, 61-43-693-698
Fast n' Fun, 250 Potreath Rd., Bellbrae West, Torquay, VIC 3228; Stephen Charr, 613 5266 1550 or 613 5266 1556; fax 613 5266 1556
Illawarra RCECC, Croomie Sporting Complex, Albion Park Rail, NSW 2527; Mel or Andrew, 042-714-683
Lakeside R/C Racing Car Club, Hollywood Dr., Lansvale, NSW 2166; R. Bartolozzi, 62-2-907-9800
Melton Electric Circuit Car Association, Safeway Car Park, corner High St. and Coburns Rd., Melton, VIC 3337; Arthur Joslin, 61-3-9747-8805
Northern Districts Model Rally Club, Inc., Rear Stanford Centre, 16 Stanford Way, Malaga, Western Australia 6066; G. Thirlwell, 61 (9) 249 3855; fax 61 (9) 249 4778; email tony@ois.com.au
Penfield Park, DSTO Complex Salisbury, Adelaide, South Australia 5108; Trevor Unsworth, 618 8289-5010
R.C. Speedway, 259 King St., Newcastle, NSW 2300; Andrew Dillon-Smith, 02-49265966
Templestowe Flat Track Racers, Templestowe Reserve, corner of Porter St. and Williamsons Rd., Templestowe, Melbourne, Victoria 31066; Renato Benci, 61 (3) 9553 4625
Wodonga R/C Car Club, 11 Murphy St., Wodonga, VIC 3690; Ron Langman, 61-60-247-128
AUSTRIA
RM-C-Wien, Aspernstrasse 5, Vienna, A-1220; Herbert Holze/Martin Hrzak, +43-664-4730376
BELGIUM
ATR-Alka-Tele-Racing, 3570 Stationstraat 21, Aiken Limburg; 0032-11-25-49-03
Cartroubles Indoor Buggy Track, Jan Moonsstraat 52-56, 2160 Wormelgem; Guy Ermes, 32-3-326-51-15; fax 32-3-326-51-01
MBV-Kampenhout, Teniersln 28, Kampenhout B1910; Frank Mostrey, phone/fax 0-16-65-75-18
MRCZ, Centrum, De Burg; Montie, 75-71-63
Model Racing Club Oudenaarde, Scheldelant, 9700 Oudenaarde; A. Chanterrie, 32-55-31-36-48; fax 32-55-30-19-12
R.C.R., Peilstraat 43, Retie 2470; A. Elen, phone/fax 32-14-379685
BRAZIL
Amoc Cassociacao de Modelismo B. Camborio, Junto ao Par Que Ecologico de Bal. Camborio, Bal. Camborio, S.C. 88.330-000; Leo Cesar, (047) 366-0001
Brasilia R/C Motor Circuit, Estacionamento do Estadio Mane Guarrincha, Brasilia, DF 70000; Alexandre (Alex), 55-061-273-7205
C.A.A.R. Curitiba Associacao de Automodelismo Radiocontrolado, Rua Theodoro Makiocha, 2300 Santa Candida, Curitiba, PR 82650-530; Ronaldo Assumpcao, 55-41-354-2804
Electric Car Club R/C Santos,

Av. Bernardino de Campos, 227, Santos, SP 11065-001; Estevam or Arnaldo, 55-013-232-2536
Hamilton Neto Associacao RC, Rua Uterere 259, Curitiba, Paran 80380-400; Danico Pilhax, 55-41-338-8041; hammer_usa@hotmail.com
Hobby Center, SOS-210 B.I.H Apt. 204, Brasilia, DF 70.273; 061-242-0488
Hobby Planet Racing Club, Rod Dom Pedro 1, KM 1315, Campinas, Sao Paulo 13091901; Daniel, Helio, Luciano, 019 258 2768
Jungle Drive, Rua Alberto Maranhao, No. 219 Icha do Gov. Rio de Janeiro, 21940-490; Paulo Brito, (021) 396-0851 or (021) 393-7449
MP Raceway, Av. Nacoes Unidas, 6815 Lapa, Sao Paulo; Gerd Heitrotter, 55-11-9819039; www.hpraceway.com.br
Off Roaders, Av. Guilherme Dummont Villars, 317, Sao Paulo, CEP 05640; Waldir Ielpo, (055) 011-260-5628; fax (055) 011-831-4931
Way of R/C Off-Road Cerrado, Rua Paraiba 1323, 1st floor, Belo Horizonte, Minas Gerais; Claudio T. Corrae, (031) 227-6111, fax (031) 227-6869
CANADA
Action Weelz, 462 Turcotte, Vanier, Quebec, G1M 1R6; Regent Tardif, (418) 527-5756
Advance R/C Raceway, 4181 Sheppard Ave. E., Scarborough, Ontario M1S 1T3; Albert Lau, (446) 321-8377
A&J Toronto R/C Raceway, 24 Main St., Bldg. B, Unionville, Ontario L3R 2E4; (905) 305-1479
The All New R.C. World, 2633 Hwy. #6, Mt. Hope, Hamilton, Ontario L0R 1W0; Dave, (905) 765-2301, Larry, (905) 333-3297 or Brian, (519) 752-0044
ATN, Auto Teleguide Nicolet, 2000 Rue Paul Hubert, Saint-Jean-Baptiste-de-Nicolet, Quebec J3T 1E5; Louis Durand, (819) 293-6097
Auto Sprint, 6065 Des Grands Prairies, St. Leonard, Quebec H3G 2R6; David Kalayjian, (514) 287-3503
Blew Bye You Raceway, 134 Dike Rd., Chilliwack, British Columbia V2P 5B1; (604) 792-8978
Circuit J.C., 1283 Chemin, St. Philippe, St. Polycarpe, Quebec J0P 1X0; Jean Castellon, (514) 265-3675
Circuit Pepsi, Centre de Location, 37 duRoi, Sorel, Quebec; (514) 746-8828
Circuit Plessis, 260 Rang 9 Ouest, Plessisville, Quebec G6L-2Y2; (819) 362-3743
Circuit R/C Pro, 1500 Chemin Sullivan, Val d'Or, Quebec; J9P 1M1; R/C Modeler Plus, (819) 874-3918
Circuit Teleguide St. Roch, 363-B St. Charles, St. Roch De L'achigan, Quebec J0K 3H0; (514) 588-4254, fax (514) 588-6554
Circuit Teleguide Grand Prix II, 701, Sainte-Rose, Ste. 200, Laprairie, Quebec, J5R 1Z2; (450) 444-1286
Club Auto Teleguides, 1750 Mlee

Interprovinc, C.P. 35, Pointe-Fortune, Quebec, J0P1N0; Jacques St. Alevis, (514) 451-0078
Club Avatt, 244 Jules-Richard, Deauville, Quebec J1N 3; Daniel Vanier, (819) 864-6262
Club RCSI, 44 Rue Holliday, Sept-Iles, Quebec G4R; Sylvio Gerard, (418) 968-6575; Hobby Shop, (418) 962-6565
CRCCC, Box 309, Clinton, Ontario N0M 1L0; Eric Russell, (519) 482-9429
CTG, 450 Chemin de la Grand Ligne, Granby, Quebec; (514) 358-4419
CTL, 495 Industriel, Longueuil, Quebec; (514) 358-4419
Dustkickers R/C Raceway, 1785 Cypress Rd., Quesnel, British Columbia V2J 4B1; Darrell Dinsdale, (250) 747-2680
Dynamic Hobbies, 21 Concourse Gate, Unit 6, Nepean, Ontario, K2E7S4; Clark Freeman, (613) 225-9634
East Coast Model Center Raceway, 13 Glen Stewart Dr., Ste 1, Southport, Prince Edward Island C1A 8X9; Gary Stephen, (902) 569-3262
Fast-Trax Speedway, RR 4, Trenton, Ontario; Russ McPeak, (613) 394-6411
Fly'n Bryan's Radical Raceway & Little Shop of Hobbies, RR #1, Ste. 12, Comp. 49, Chase, British Columbia V0E 1M0; Bryan Coffey/Dani Potvin, (604) 955-0669
Gilles Coitois, 1458 Boul. Lafleche, Bale-Comeau, Quebec G5C 1E1; (418) 295-1830
Hobby 2000, 75 St.-Jean-Baptiste, Ste. 140, Chateaugay, Quebec J6J 3H6; Hugues-Andre Meloche, (450) 698-2000
Honda House Motor Speedway, 384 Richmond St., Chatham, Ontario N7M 1P9; John Elliot, (519) 354-5530
Interior R/C Raceway, 34-1605 Summit Dr., Kamloops, BC, V2E 2A5; Martin Vannieuwenhuizen, (604) 374-1268 or (604) 374-8458
J-T International Raceway, 127 Milligan Ln., Nanapanee, Ontario K7R 8A1; N. O'Neill, (613) 354-0099
Leading Edge R/C Speedway, 731 Gardiniers Rd., Kingston, Ontario K7M 3Y5; Mike and Tony Dalcar, (613) 389-4878
Mid-Canada R/C Speedway, 216 Hutchings, Winnipeg, Manitoba R3H 0L3; Richard Driedger, (204) 339-6566
Miniatures & Passions, 204 St. Charles, #103, Ste. Therese, Quebec J7E 2 B4; Gilles Lachance, (514) 979-7989
MORRAC Raceway, 6449 Crowchild Tr. S.W., Box 36060, Calgary, Alberta T3E 7C8; (403) 254-1386
Off-Road R/C Raceway, 76 Eddystone Ave., North York, Ontario M3N-1H4; Ron Lefebvre, (416) 740-0536
Prince George Radio Controlled Car Club, 202 Explorer Cres., Prince George, B.C. Y2M5R8; Doug Waller, (604) 561-0035
Quintrax Speedway, 610 Dundas St.

East, Belleville, Ontario K7K 2M1; (613) 962-1414; fax (613) 962-7306
Randy Shantz Raceway, 1015 W. 14th St., North Vancouver, British Columbia; Steve Mulhall, (604) 945-3888
R/C Champ Raceway, 670 Progress Ave., Rear Unit #13-16; Scarborough, Ontario M1H 3A4; Ben, Matthew or Louie, (416) 289-8717
Recreation R/C Raceway, Hwy. 16 and Ferry Ave., Prince George, BC; Doug Waller, (604) 561-0035
Ronbo's R/C Racing, R.R. 1, Glen Walter, Cornwall, Ontario K6H 3G4; Ron Giroux, (613) 936-0176
Rousillon Hobby Track, 177-D St. Jean Baptiste, Chateaugay, Quebec J6K 3B4; (514) 698-2151
Shadetree Raceway, R.R. #4, 22566 Stage Rd., Thamesville, Ontario; Darrin Charbonneau, (519) 692-5211
Snye Wreck RC, R.R. #1, St. Regis, Quebec H0M 1A0; Aimee Mitchell, (613) 575-2496
South Muskoka R.C. Track & Mini Putt, 8903 Hwy. 11, Orillia, Ontario L3V 6H3; Justin Fortin, (705) 329-0397
Spinnin Wheel Raceway, RR 1, Ariss, Ontario N0B 1B0; (519) 824-1614
South Okanagan Roadhogs, Skha Lake Rd., Penticton, BC; Willie Lemm, (604) 492-5698
Steeltown Speedway, 3580 Kirk Rd. West, Binbrook, Ontario L0R 1C0; Paul Snyder, (905) 227-7508
Sudbury Organized Auto Racing, 765 Barrydowne Rd., Sudbury, Ontario P3A 3T6; Ken Moore, (705) 524-5339
Thunder Alley Raceway, Lambton Mills, 1380 London Rd., Sarnia, Ontario N7S 1P8; Rob Smith, (519) 882-3361
Vancouver R/C Road Racers, #100-2733 Barney Hwy., Coquitlam, British Columbia V3E1K9; Roger Brown, (604) 945-3888
Club De Automodelismo Colombiano, Centro Recreativo Cafam, Kilometro 14 Autopista Norte, Santafe De Bogota, D.C.; Jorge Delgado, 0-1305588
Club De Automodelismo Colombiano, Centro Comercial Guaymaral, Kilometro 16 Autopista Norte, Santafe De Bogota, D.C.; Jorge Delgado, 1-6130588
Garoso Raceway, Avenida Libertadores con Diagonal Gran Colombia, Cucuta; Gabriel Rodriguez, 975-751892
Racing Model Club, Kennedy Ave. N. 42, Nicosia; Andrea Sotiriou, 493186; fax 493229
Brondby Motor Club, Roskildevej 460 Brondby 2605; Soren Boy Holst, 45-36-472-462
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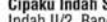
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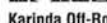
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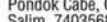
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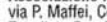
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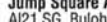


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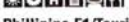


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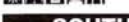


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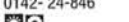
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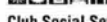
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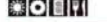
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Chris's BACK LOT

The opinions expressed on this page do not necessarily represent the opinions of the entire *Car Action* staff. Any resemblance to reality is purely coincidental. Send your correspondence, hate mail, love letters, photographs—anything you like—to Chris's Back Lot, c/o *R/C Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606. My email address is: chris@airage.com.

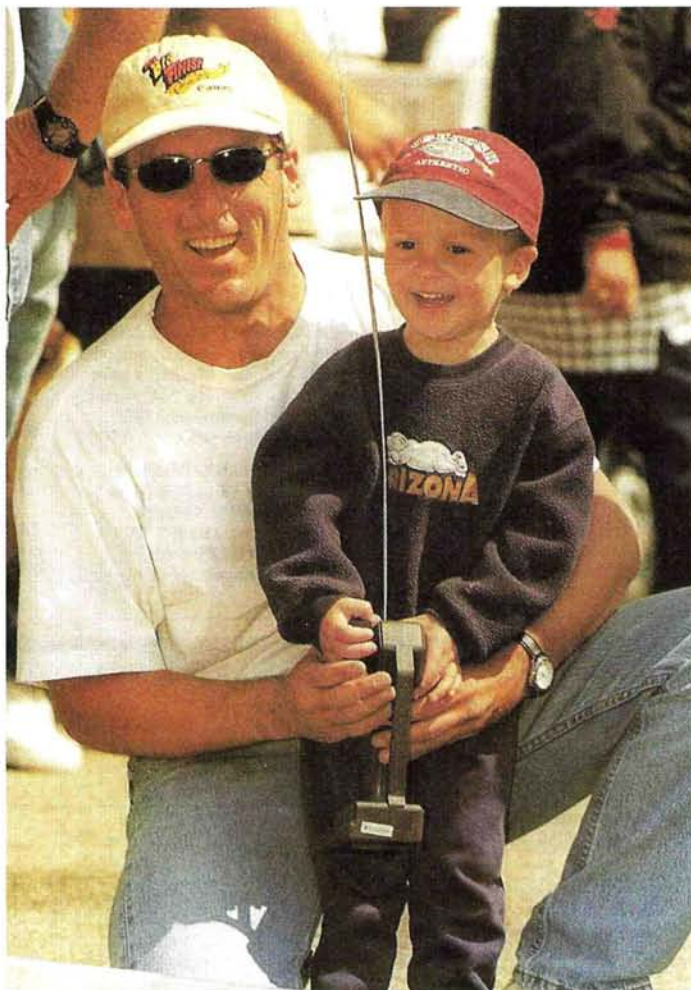
BY CHRIS CHIANELLI

Team Happy

There are lots of R/C race teams out there, both big and small—some with the latest race equipment, the best drivers and competitive philosophies backed by serious factory support and sponsorship. You read about them in the pages of *Car Action* all the time, and well you should, for they are an important part of our hobby and offer inspiration to those hopeful enthusiasts who are turned on by the notion of someday being a part of the serious racing scene.

Serious race teams notwithstanding, by far the most important team, in my humble opinion, is the father-and-son team such as the one pictured here. And I can't think of any institution that does more to support this type of team than Hobby Shack, with the parking-lot events it organizes, such as Expo '99, which I attended at its new store at Rancho Cucamonga, CA. Nowhere have I found such a coordinated mix of pro racers, first-timers and everyone in between having such a grand time together running R/C cars.

Whenever I go to a race, I always scan the crowd with the telephoto to get candid shots. I spotted these two at the "Try Me Track." Not only do their expressions say far more than I ever could, even if "Back Lot" were 10 pages long, but they exemplify the overall joyous mood and happy spirit of this event. As you can see, dad caught me stealing their images but junior was far too into it to notice what the wild-looking guy



with the Nikon was up to. Thanks to Hobby Shack and Traxxas, these two "kids" had a first experience with R/C they aren't likely to forget. I think we can assume that junior dragged dad into the hobby shop to investigate the purchase of his first car. Dad probably got his first car, too! If any of you élitists out there don't recognize the importance of a positive first-time R/C experience for the survival of our hobby, then all I can say to you is: you're as stupid as my hair looks.

The happy events of the day also convinced some who do have a vested interest in world-class racing teams—convinced them that Hobby Shack is doing the cause of R/C racing a great service. Two such individuals from that "high-power" racing world are Gene Hastings of Team Associated and Gill Losi Jr. of Team Losi. Both recognized the magic of the day and what it means to the future of their companies and to the health of the hobby overall. Both of these "world class" gentlemen told me they would make it their business to be part of such positive happenings from now on. These guys are smart; how do you think they got where they are?

Events such as Expo '99 take a lot of work to organize. I hope the important parties in our industry realize this and step up to the plate by supporting Hobby Shack or by starting a similar goodwill event of their own. I personally thank Hobby Shack and, in particular, its founder, Paul Bender, for having the insight, for putting forth the effort and for the endless stream of smiling faces like the ones you see here. ■



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 18910 Teller Ave., Irvine, CA 92612; (949) 833-8873; fax (949) 833-1631; www.teamnovak.com.

OFNA Racing
 22692 Granite Way, Ste. B, Laguna Hills, CA 92653; (949) 586-2910; fax (949) 586-8812.

O.S.
 See Great Planes.

Paragon Racing Products
 340 Industrial Blvd., Waconia, MN 55387-1738; (612) 442-6364; fax (612) 442-6368.

Paris Racing
 4254 Independence St., Chino, CA 91710; (909) 465-1189; fax (909) 465-0089; www.parisracing.com.

Parma/PSE
 13927 Progress Pky., North Royalton, OH 44133; (440) 237-8650; fax (440) 237-6333.

Performance Hobby
 1293 NW Wall, Ste. 1492, Bend, OR 97701; (541) 389-6160; fax (541) 389-1923.

Progressive Suspension
 11129 G Avenue, Hesperia, CA 92345; (760) 948-4012; fax (760) 948-4307; www.progressivesuspension.com.

Pro-Line/Jaco
 P.O. Box 456, Beaumont, CA 92223; (909) 849-9781; fax (909) 849-2968.

Race Prep
 P.O. Box 494, Paulden, AZ 86334; (602) 636-1955; fax (602) 636-1956; www.raceprep.com.

Reedy Modifieds/Team Associated
 3585 Cadillac Ave., Costa Mesa, CA 92626; (714) 850-9342; fax (714) 850-1744.

Robinson Racing Products
 4968 Meadow View Dr., Mariposa, CA 95338; (209) 966-2465; fax (209) 966-5937; www.robinsonracing.com.

RPM Inc.
 14978 Sierra Bonita Ln., Chino, CA 91710; (909) 393-0366; fax (909) 393-0465.

Schumacher USA
 6302 Benjamin Rd., Ste. 404, Tampa, FL 33634; (813) 889-9691; fax (813) 889-9593; www.racing-cars.com.

Serpent Inc. USA
 West Park Center, 2832 NW 79th Ave., Miami, FL 33122; (305) 639-9665; fax (305) 639-9658.

Tamiya America Inc.
 2 Orion, Aliso Viejo, CA 92656-4200; (800) TAMIYA-A; fax (949) 362-2250; www.tamiya.com.

Team Associated
 3585 Cadillac Ave., Costa Mesa, CA 92626; (714) 850-9342; fax (714) 850-1744; www.teamassociated.com.

The Eastwood Co.
 Box 296, Malvern, PA 19355-0296; (610) 640-1450; fax (610) 644-11450; fax (610) 644-0560; www.eastwoodco.com.

Trinity Products Inc.
 36 Meridian Rd., Edison, NJ 08820; (732) 635-1600; fax (732) 635-1640; www.teamtrinity.com.

Wiha Corp.
 1348 Dundas Circle, Monticello, MN 55362; (800) 494-6104; fax (800) 494-7456; www.wihatools.com.

Xipp Mfg.
 Gene Kochiuba, 4201 Church Rd., Ste. 265, Mt. Laurel, NJ 08054; (609) 778-9477; fax (609) 778-9497; www.xipp.com.